INDUSTRIAL MEDICINE AND SURGERY

Volume 22 SEPTEMBER 1953 Number 9

For prompt control of infection of

TRAUMATIC LESIONS:

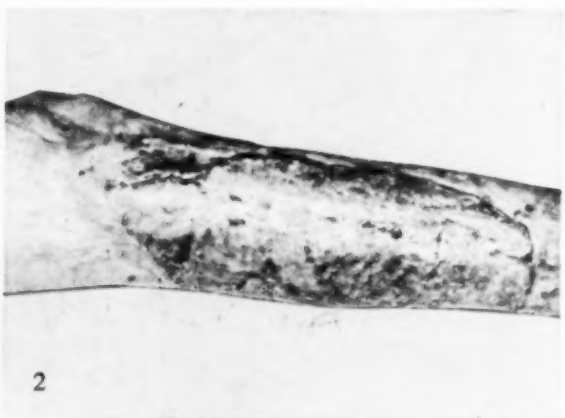
FURACIN

BRAND OF NITROFURAZONE N.N.R.

A stable bactericide without tissue toxicity:

FURACIN SOLUBLE DRESSING

1



2

Injury 15 years previously, of the right leg of a man 45 years old, had never healed.

There was extensive superficial ulceration and profuse purulent discharge with Ps. aeruginosa (pyocyaneus), P. vulgaris, diphtheroids, Str. pyogenes, M. pyogenes albus (Fig. 1).

December 4. Furacin Soluble Dressing was applied twice daily with gauze covering. Discharge soon decreased and granulations were filling in. Fibrous tissue was curetted and the lesion skin-grafted. Furacin therapy was continued. There was a favorable percentage of "take."

January 7. Patient discharged (Fig. 2).

Some advantages of Furacin:

- wide antibacterial spectrum
- designed for external use only
- negligible toxicity for human tissues

Formula: Furacin preparations contain Furacin® 0.2% in water-miscible vehicles which dissolve in exudates.

Literature on request

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

EATON LABORATORIES Inc.
NORWICH NEW YORK

The NITROFURANS
A unique class of antimicrobials

FURACIN SOLUBLE DRESSING • FURACIN SOLUTION • FURACIN ANHYDROUS EAR SOLUTION

Taste Toppers . . . for all ages

that's what physicians and patients alike call these two favorite dosage forms of Terramycin because of their unsurpassed good taste. They're nonalcoholic — a treat for patients of all ages, with their pleasant raspberry taste. And they're often the dosage forms of first choice for infants, children and adults of all ages.

Terramycin®

BRAND OF OXYTETRACYCLINE

Pediatric Drops

Each cc. contains 100 mg. of pure crystalline Terramycin. Supplied in 10 cc. bottles with special dropper calibrated at 25 mg. and 50 mg. May be administered directly or mixed with nonacidulated foods and liquids. Economical 1.0 gram size often provides the *total dose* required for treatment of infections of average severity in infants.

Supplied: Bottles of 1.0 Gm.

Oral Suspension *(Flavored)*

Each 5 cc. teaspoonful contains 250 mg. of pure crystalline Terramycin. Effective against gram-positive and gram-negative bacteria, including the important coli-aerogenes group, rickettsiae, certain large viruses and protozoa.

Supplied: Bottles of 1.5 Gm.

Pfizer PFIZER LABORATORIES, *Brooklyn 6, N. Y., Division, Chas. Pfizer & Co., Inc.*

Melmac* Orthopedic Composition

for lighter, thinner, stronger casts

Davis & Geck's Melmac Orthopedic Composition is a melamine resin,[1] a new powder with catalyst which *doctors* add to the water in which *they* wet plaster bandages. With Melmac Orthopedic Composition, *doctors* need only *half the usual number of plaster of Paris bandages.* Melmac has been proven by extensive clinical trials.[1-3]

Greater comfort for patients

Cast A—ordinary plaster of Paris

Cast B, *plaster fortified with Melmac*, is half thickness of cast A and weighs less

6 great advantages of casts made with Melmac Orthopedic Composition

1. *Four times the early strength* and over twice the dry strength of ordinary plaster of Paris casts.
2. *Lighter, thinner and stronger casts* provide added comfort and support.
3. *Water and urine resistant.* Does not disintegrate even after several days soaking.
4. *Permits better x-ray penetration* due to thinness of cast.
5. Economical—*50% fewer bandages or less needed;* saves the doctor time.
6. *Conveniently packaged* to permit using as much or as little as is needed for a given case, avoiding waste.

Supplied: In cartons of 3.65 lb. containing six cans of 9.74 oz. (276 Gm.) each; available through surgical supply dealers handling D & G products.

Davis & Geck, Inc. 57 Willoughby Street, Brooklyn 1, N. Y.

Sutures and other surgical specialties

*TRADEMARK
†PRODUCT OF AMERICAN CYANAMID COMPANY

Use of Melmac requires no new technique

To use bandages and splints wetted with Melmac solution, no new technique for applying casts need be learned. Plaster rolls or splints are soaked in the Melmac solution in the usual manner, the excess solution is pressed out, and the cast applied with the same technique as with ordinary plaster bandages and splints.

Note:

Cobey,[3] reports not one person allergic to Melmac in applying 1000 casts.

references:

1. A. W. Spittler, Col., (M.C.), U.S.A., J. J. Brennan, Lt. Col., (M.C.), U.S.A., J. W. Payne, Capt., U.S.A.F. (M.C.), American Academy of Orthopedic Surgeons, Jan. 26-31, 1952, Chicago, Illinois.
2. M. C. Cobey, M.D., F.A.C.S., Professor of Orthopedic Surgery, Georgetown University and Senior Attending Orthopedic Surgeon, Children's Hospital, Washington, D.C., The American Surgeon, Vol. XVIII, No. 4, April, 1952, pp. 413, 415.
3. M. C. Cobey, M.D., F.A.C.S., Washington, D.C., private communication.

Davis & Geck manufactures a complete line of surgical sutures. Diameter for diameter, D&G Surgical Gut is the strongest available.

INDUSTRIAL MEDICINE AND SURGERY

The Journal of Medicine in Industry

This Journal is dedicated to the advancement of sound industrial medicine, including the surgery of industrial trauma. To that end its varying contents will embrace scientific papers, reports, digests, news items and official statements, together with editorial comment. The editorial policy is to avoid undue censorship. Some contributions ably prepared will be published although contravening the personal opinions of the editors. Care will be exercised in checking the accuracy of known facts, as printed, but in all other respects statements and opinions are those of the author and may not be shared by the editors. On any article, the editors reserve the right to comment favorably or otherwise, in the current or any subsequent issue. On this basis, contributions are invited. The opinions expressed in any contributions, including the editorials of this Journal, do not necessarily reflect the attitude or opinions of any associated organization.

Volume 22 SEPTEMBER 1953 *Number 9*

Contents

THE CONSUMER OF INDUSTRIAL HEALTH SERVICES	Rear Admiral H. E. Haven, USN	373
ORGANIC PHOSPHATE INSECTICIDES	Harry H. Utes, M. P. H.	375
HAND INJURIES: THE IMMEDIATE TREATMENT OF ACUTE OPEN WOUNDS	Michael L. Mason, M.D.	378
LEAD AND LEAD POISONING IN EARLY AMERICA: BENJAMIN FRANKLIN AND LEAD POISONING	Carey P. McCord, M.D.	393
PROSTHETIC REPLACEMENT OF THE METACARPAL HEAD	W. Russell MacAusland, M.D.	400
BERNARDINO RAMAZZINI—FOUNDER OF OCCUPATIONAL MEDICINE	Fortunato M. Triosi, M.D.	403
PRESIDENT'S PAGE	George F. Wilkins, M.D.	410
BOOKS		411
EDITORIALS		
NEW DISEASES FOR OLD		413
WEIL'S DISEASE		413
HOW TO HANDLE WOMEN		413
Associations: Officers and Directors		4, 6, 8, 10
Personal		6
Dr. Legge's Almanac		14
News, Comment, Opinion		43
(Advertisers' Index		54)

Next Month

The October number of Industrial Medicine and Surgery will be a Special Twenty-First Anniversary Issue—featuring two decades of the dynamic growth of Medical Services in Industry.

INDUSTRIAL MEDICINE AND SURGERY, The Journal of Medicine in Industry (with which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery"): Entered as second class mail matter August 28, 1941, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Reentered, October 3, 1949. Additional entry at Sheboygan, Wisconsin. Published on the fifth of each month by INDUSTRIAL MEDICINE PUBLISHING COMPANY, Chicago. STEPHEN G. HALOS, President and Advertising Manager; STEPHEN F. HALOS, Vice-President and Assistant Advertising Manager; A. D. CLOUD, Publisher; CAREY P. MCCORD, M.D., Editor; DORIS FLOURNOY, Editorial Assistant; HAROLD A. HOOPER, Treasurer. Member, Adult Bureau of Circulations. PUBLICATION, EDITORIAL and EXECUTIVE OFFICES, 605 North Michigan Avenue, Chicago 11, Illinois. Subscription $6.00 per year in the United States; $6.50 (U.S. Currency) per year in Canada; $7.00 (U.S. Currency) per year in other countries. Single copies 75 cents. Title Registered in United States Patent Office. Rd. Canada, 1942. Copyright, 1953, by Industrial Medicine Publishing Company, Chicago. CHANGE OF ADDRESS: FOUR weeks' notice required; changes cannot be made without old address as well as new; please furnish zone number for new address if city requires it.

INDUSTRIAL AND RAILWAY MEDICAL AND SURGICAL ASSOCIATIONS

INDUSTRIAL MEDICINE AND SURGERY

is the official publication of these organizations but is independently owned and published

INDUSTRIAL MEDICAL ASSOCIATION

OFFICERS

President:
GEORGE F. WILKINS, M.D.,
New England Tel. & Telegraph Co.,
Boston 9, Massachusetts.

President-Elect:
ROBERT COLLIER PAGE, M.D.,
Standard Oil Company (N.J.),
30 Rockefeller Plaza,
New York 20, New York.

First Vice-President:
KIEFFER, DAVIS, M.D.
Phillips Petroleum Company.
Bartlesville, Oklahoma.

Second Vice-President:
E. S. JONES, M.D.,
418 Calumet Building,
Hammond, Indiana.

Secretary:
ARTHUR K. PETERSON, M.D.,
R. R. Donnelley & Sons Company
350 East 22nd Street,
Chicago 16, Illinois.

Treasurer and Managing Director:
EDWARD C. HOLMBLAD, M.D.,
28 East Jackson Blvd.,
Chicago 4, Illinois.

DIRECTORS
1952-54

RUSSELL G. BIRRELL, M.D.,
Imperial Oil Limited,
56 Church Street
Toronto 1, Ontario, Canada.

BENJAMIN M. FREES, M.D.,
629 South Westlake Avenue,
Los Angeles 5, California.

H. GLENN GARDINER, M.D.,
Inland Steel Company,
East Chicago, Indiana.

EARL F. LUTZ, M.D.,
General Motors Corporation,
General Motors Building,
Detroit 2, Michigan.

GRADIE R. ROWNTREE, M.D.,
Fawcett-Dearing Printing Co.,
Louisville 1, Kentucky.

L. HOLLAND WHITNEY, M.D.,
New Jersey Bell Telephone Co.,
Newark 1, New Jersey.

1953-55

EDWIN DEJONGH, M.D.,
Detroit Diesel Engine Division,
General Motors Corporation,
Detroit, Michigan.

JOHN E. KIRKPATRICK, M.D.,
516 Sutter Street,
San Francisco 2, California.

H. W. LAWRENCE, M.D.,
Procter and Gamble Company,
Cincinnati 17, Ohio.

JOHN L. NORRIS, M.D.,
Kodak Park Works, Eastman Kodak
Company, Rochester, New York.

CHARLES F. SHOOK, M.D.,
Owens-Illinois Glass Company,
Toledo 1, Ohio.

R. LOMAX WELLS, M.D.,
Chesapeake & Potomac Telephone Co.,
Washington 5, D.C.

BOARD OF EXAMINERS FOR FELLOWSHIP

HENRY S. BROWN, M.D., 1951-54.
MCIVER WOODY, M.D., 1952-55.
ADOLPH G. KAMMER, M.D., 1953-56.

DISTRICTS AND COUNSELORS

District
1 JAMES I. ROBERTS, M.D.
Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island.
2 FRANK R. FERLAINO, M.D.
Metropolitan New York and Northern New Jersey.
3 JOHN L. NORRIS, M.D.
Niagara Frontier District.
4 GLENN S. EVERTS, M.D.
Eastern Pennsylvania, Southern New Jersey, Delaware.
5 WALTER E. FLEISCHER, M.D.
Maryland, Virginia, District of Columbia.
6 MACROY GASQUE, M.D.
North Carolina, South Carolina.
7 ALLEN M. COLLINSWORTH, M.D.
Florida, Georgia.
8 JOSEPH T. NOE, M.D.
Western Pennsylvania, West Virginia.
9 REX H. WILSON, M.D.
Eastern Ohio.
10 H. W. LAWRENCE, M.D.
Western Ohio.
11 PAUL J. OCHSNER, M.D.
Michigan.
12 JULIUS E. WILLIAMS, M.D.
Tennessee.
13 GRADIE R. ROWNTREE, M.D.
Kentucky.
14 HARRY V. SIMS, M.D.
Alabama, Mississippi, Louisiana.
15 EMMETT B. LAMB, M.D.
Illinois, Indiana.
16 DANIEL E. DORCHESTER, M.D.
Wisconsin and Upper Michigan Peninsula.
17 LEONARD S. ARLING, M.D.
Minnesota, North Dakota, Iowa, South Dakota.
18 R. EMMET KELLY, M.D.
Missouri, Kansas, Nebraska.
19 TOM HALL MITCHELL, M.D.
Arkansas, Oklahoma.
20 GEORGE V. LAUNEY, M.D.
Northern Texas.
21 CARL U. DERNEHL, M.D.
Southern Texas.
22 RONALD P. RAWLINSON, M.D.
Montana, Idaho.
23 NATHANIEL A. THOMPSON, M.D.
Wyoming, Colorado, Utah, Nevada.
24 LEWIS M. OVERTON, M.D.
Arizona, New Mexico.
25 LLOYD M. FARNER, M.D.
Washington.
26 FORREST E. RIEKE, M.D.
Oregon.
27 JOHN E. KIRKPATRICK, M.D.
Northern California and Bay Area.
28 CLARENCE L. LLOYD, M.D.
Southern California.
29 FRANK HATLELID, M.D.
Territory of Hawaii.
30 W. HARVEY CRUICKSHANK, M.D.
Eastern Canada.
31 DOUGLAS R. WARREN, M.D.
Mid Canada.
32 WALTER SAUNDERS, M.D.
Western Canada.

COMMITTEES

By-Laws
E. A. IRVIN, M.D., Chairman
J. DUANE MILLER, M.D.
A. K. PETERSON, M.D.

Civil Defense
M. H. MANSON, M.D., Chairman
A. J. FLEMING, M.D.
R. E. MASTERS, M.D.
E. J. SCHOWALTER, M.D.

Education and Training
A. G. KAMMER, M.D., Chairman
O. T. MALLERY, JR., M.D.
L. C. MCGEE, M.D.
J. WISTER MEIGS, M.D.
IRVING R. TABERSHAW, M.D.
H. A. VONACHEN, M.D.

Foundation Activities
KIEFFER DAVIS, M.D., Chairman
JOHN L. NORRIS, M.D.
JOHN J. POUTAS, M.D.
G. R. ROUNTREE, M.D.

Health Achievement in Industry
J. F. MCCAHAN, M.D., Chairman
O. T. MALLERY, JR., M.D.

History Committee
A. H. WHITTAKER, M.D., Chairman
J. I. ROBERTS, M.D.
MCIVER WOODY, M.D.

Human Relations
NORMAN PLUMMER, M.D., Chairman
L. E. HINKLE, JR., M.D.
WILLIAM P. ECKES, M.D.
L. J. WADE, M.D.

Knudsen Award
H. S. BROWN, M.D., Chairman
E. A. IRVIN, M.D.
M. H. KRONENBERG, M.D.

Medical Care Committee
W. A. SAWYER, M.D., Chairman
J. W. BROWN, JR., M.D.
LEO PRICE, M.D.
F. W. SLOBE, M.D.
D. S. THURBER, M.D.

Membership Committee
C. F. SHOOK, M.D., Chairman
C. U. DERNEHL, M.D.
D. E. DORCHESTER, M.D.

Merit in Authorship Award Committee
C. P. MCCORD, M.D., Chairman
R. E. ECKARDT, M.D.
J. S. FELTON, M.D.
E. L. WALSH, M.D.

1954 IMA CONFERENCE, CHICAGO, APRIL 24-30, 1954

SEDAMYL

[ACETYLBROMDIETHYLACETYLCARBAMID SCHENLEY]

helps the patient escape from the psychosomatic maze

in anxiety states

sedation without hypnosis

ideal for daytime use...

Because SEDAMYL* quickly helps overcome anxiety, apprehension, and nervousness without causing drowsiness, "hangover", or impaired perception, it is considered ideal for low-level daytime sedation. Under the gentle influence of SEDAMYL, the patient feels as though he is having one of his "good" days.

SEDAMYL is quickly absorbed, affording rapid and full response. Readily metabolized, it is well tolerated in therapeutic doses and does not produce undesirable circulatory or respiratory effects.

SUPPLIED: Tubes containing 20 tablets; bottles containing 100 tablets; each tablet provides 0.26 Gm. (4 gr.) of acetylbromdiethylacetylcarbamid.

SEDAMYL is not a barbiturate. Professional literature and samples on sequest.

SCHENLEY LABORATORIES, INC., 350 Fifth Ave., New York 1

© Schenley Laboratories, Inc.

*Trademark of Schenley Laboratories, Inc.

I.M.A. COMMITTEES — Continued

Meritorious Service Award Committee
H. W. LAWRENCE, M.D., Chairman
E. C. HOLMBLAD, M.D.
E. P. LUONGO, M.D.

Past Presidents Committee
E. A. IRVIN, M.D., Chairman
A. G. KAMMER, M.D.

Committee on Practice
P. J. BAMBERGER, M.D., Chairman
J. J. BRANDABUR, M.D.
FRANK E. GRAY, M.D.
R. T. JOHNSTONE, M.D.
R. EMMET KELLY, M.D.
CLARENCE L. LLOYD, M.D.
GEORGE O. NELSON, M.D.

Public Relations Committee
J. J. POUTAS, M.D., Chairman
C. E. DUTCHESS, M.D.
B. M. FREES, M.D.
R. EMMET KELLY, M.D.
J. F. SHRONTS, M.D.

Publications and Editorial
L. C. MCGEE, M.D., Chairman
R. F. BUCHAN, M.D.
D. R. WARREN, M.D.

Workmen's Compensation & Insurance
C. T. OLSON, M.D., Chairman
L. S. ARLING, M.D.
T. I. BOILEAU, M.D.
N. J. ROBERTS, M.D.
W. M. WEEDEN, M.D.

SCIENTIFIC COMMITTEES

General Scientific Committees
FRANK PRINCI, M.D., Chairman

Chest Diseases
A. J. VORWALD, M.D., Chairman
L. E. HAMLIN, M.D.
LEO PRICE, M.D.
O. A. SANDER, M.D.

Dermatology
J. V. KLAUDER, M.D., Chairman
F. C. COMBES, M.D.
J. G. DOWNING, M.D.
G. E. MORRIS, M.D.
LOUIS SCHWARTZ, M.D.

Geriatrics and Retirement
C. E. DUTCHESS, M.D., Chairman
R. R. ROBSON, M.D.
W. A. SAWYER, M.D.
H. E. TEBROCK, M.D.
R. LOMAX WELLS, M.D.
C. F. YEAGER, M.D.

Problem Drinking
R. G. BELL, M.D., Chairman
RONALD F. BUCHAN, M.D.
W. H. CRUICKSHANK, M.D.
PAUL A. DAVIS, M.D.
J. S. FELTON, M.D.
S. CHARLES FRANCO, M.D.
D. JOHN LAUER, M.D.
L. R. MARTIN, M.D.
C. W. MCGILL, M.D.
J. I. ROBERTS, M.D.
J. W. SHILLING, M.D.
B. L. VOSBURGH, M.D.
E. L. WALSH, M.D.

Surgery of Trauma
A. H. WHITTAKER, M.D., Chairman
J. M. DZIOB, M.D.
F. B. MACMILLAN, M.D.
R. A. SUTTER, M.D.
J. L. THOMPSON, M.D.
J. HUBER WAGNER, M.D.

Toxicology
R. M. WATROUS, M.D., Chairman
D. W. FASSETT, M.D.
E. V. HENSON, M.D.
L. MASON LYONS, M.D.
L. W. SPOLYAR, M.D.

Personal

THOMAS A. LINCOLN, M.D., became Director of the Health Division of the Oak Ridge National Laboratory July 15, 1953. DR. LINCOLN was a staff physician at Oak Ridge from August 8, 1951, to March 1, 1952; has been Assistant Medical Director since the latter date. He is a graduate of the University of Minnesota Medical School and interned at Ancker Hospital, St. Paul. For a time he was engaged in private practice in Minneapolis.

A SYMPOSIUM on Occupational Diseases of the Chest will be a feature of the eighth annual postgraduate course on chest diseases, sponsored by the American College of Chest Physicians, to be held at Knickerbocker Hotel, Chicago, September 28 to October 2, 1953. E. C. HOLMBLAD, M.D., is to be Moderator; and OSCAR A. SANDER, M.D., LOUIS L. FRIEDMAN, M.D., and JOSEPH H. CHIVERS, M.D., the speakers and panel members.

NORVIN C. KIEFER, M.D., former Ohio physician, who has been Chief of Health Services for the Federal Civil Defense Administration, is leaving that post to become Chief Medical Director for the Equitable Life Assurance Society of New York. His many friends in Ohio and throughout the nation will wish him well in his new position. DR. KIEFER'S record of accomplishment in F.C.D.A., in the face of budget difficulties and public apathy, was outstanding. None worked harder to put real life into a vital agency but one which has not as yet received the public support it deserves because too many figure "it can't happen here." Those in the field who are concerned with civil defense planning and organizing appreciate the valuable service DR. KIEFER rendered during his tenure with F.C.D.A.

—*Ohio State Med. J.*, August, 1953.

ALBERT S. GRAY, Deputy Commissioner of the Connecticut State Department of Health, has retired after 25 years of service. Appointed Chief of the Division of Occupational Diseases in 1928, DR. GRAY has established a pattern for industrial workers which has since been followed by 40 states and many large cities in our country. For 22 years he guided the department's occupa-

New England Industrial Medical Association

Officers—1952-1953

JOSEPH C. JOHNSTON, M.D., President
70 Laurel Street, Providence, R.I.

HALSTEAD MURRAY, M.D., Vice-President
Dennison Mfg. Co.
Framingham, Mass.

J. ALLAN THOMPSON, M.D., Secretary-Treasurer
New England Telephone and Telegraph Company
245 State Street, Boston, Mass.

Board of Directors—1952-1953

PRESTON N. BARTON, M.D.
New Departure Div., General Motors
Bristol, Connecticut

KARL T. BENEDICT, M.D.
Norton Company, Worcester, Mass.

F. W. BARDEN, M.D.
Saco Lowell Shops
Biddeford, Maine

HENRY F. HOWE, M.D.
Proctor & Gamble, Quincy, Mass.

LEONARD LANDRY, M.D.
Simplex Wire & Cable
Cambridge, Mass.

TIMOTHY F. ROCK, M.D.
International Shoe Co.
Nashua, N. H.

Component Society of the Industrial Medical Association.

Rhode Island Society of Industrial Physicians and Surgeons

Officers

RICHARD F. MCCOART, M.D., President
Universal Winding Company, Cranston.

THOMAS A. EGAN, M.D., Vice-President
New Haven Railroad, Providence.

JAMES P. DERBY, M.D., Secretary
Division of Industrial Hygiene, State Department of Health, Providence.

ROBERT T. HENRY, M.D., Treasurer
Newman Crosby Company, Pawtucket.

Board of Directors

FRANK A. FERLIANO, M.D.
Providence Tuberculosis League, State of Rhode Island, Providence.

REMINGTON P. CAPWELL, M.D.
Whittet-Higgins Co., Providence.

EDWARD F. DOUHERTY,
Liberty Tool and Gauge Co., Providence.

JOSEPH C. JOHNSTON, M.D.,
Texas Company, Providence.

CHARLES L. FARREL, M.D.
Collyer Insulated Wire Co.
Pawtucket.

Section of the New England Industrial Medical Association.

New York State Society of Industrial Medicine, Inc.

Officers

DENNIS RYAN GILLEN, M.D., President
81 Washington Street, Brooklyn 1, N.Y.

SAMUEL M. HYMAN, M.D., Vice-President
221 West 36th Street, New York 18.

A. GLENNON FLAGG, M.D., Secretary
440 West 34th Street, New York 1.

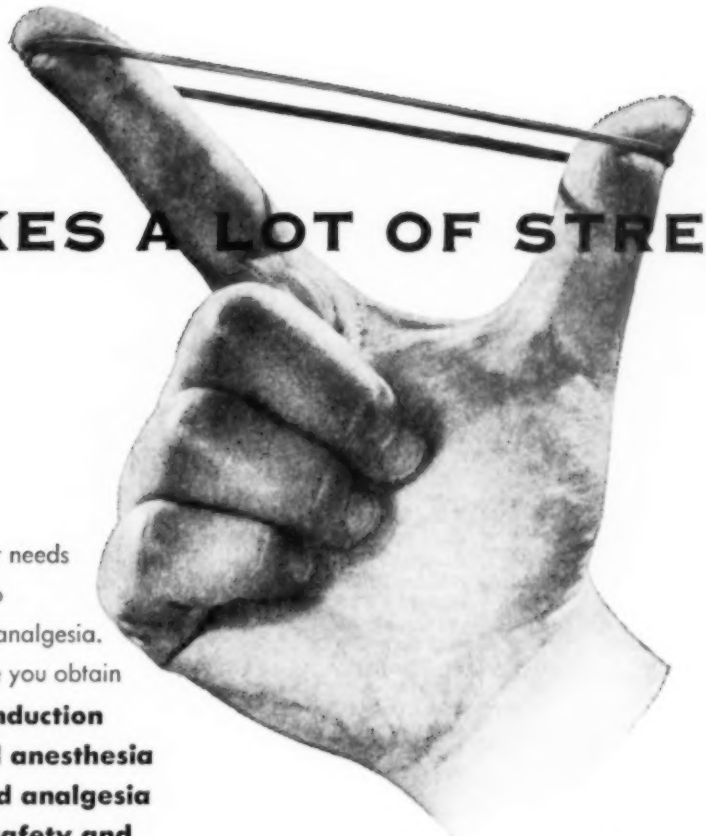
JOHN J. BLACKFORD, Executive Secretary
70 Saratoga Ave., Yonkers 5, N.Y.

Executive Council

ROBERT G. WOOLSEY, M.D., New York City
FRANK R. FERLAINO, M.D., New York City

The Industrial Doctor
(Reg. U.S. Pat. Off.)
Now combined with
INDUSTRIAL MEDICINE and SURGERY

IT TAKES A LOT OF STRETCH



. . . to cover all your needs
when it comes to
anesthesia and analgesia.
With Pontocaine you obtain

prompt induction
sustained anesthesia
prolonged analgesia
relative safety and
convenience

Surgeons and anesthesiologists who use Pontocaine for nerve block and infiltration analgesia know that you can stretch operating time to as much as five hours and postoperative analgesia to nine hours.

Pontocaine's much longer duration of action allows you to complete a surgical procedure without fear that the anesthesia may wear off . . . without apprehension that the postoperative analgesia won't be long enough to give your patient a good start towards recovery.

And it takes so little Pontocaine to do it . . . only 0.1 to 0.2 per cent concentration . . . leaving you with a relatively *wide margin of safety.*

PONTOCAINE®
HYDROCHLORIDE

Winthrop-Stearns Inc.
New York 18, N. Y. • Windsor, Ont.

WINTHROP

sustained anesthesia
2 to 5 hour nerve block
2 to 3 hour spinal
prolonged analgesia
5 to 9 hour pain relief

For 5 hour nerve block
(surgical, diagnostic
and therapeutic),
for Infiltration and Continuous
Caudal Analgesia
0.15 per cent solution,
vials of 100 cc.

For 2 to 3 hour spinal anesthesia
"Niphanoid"® 10 mg.,
15 mg. and 20 mg.
1 per cent solution,
ampuls of 2 cc. (20 mg.)

Also available as
0.5 and 2 per cent solutions
for topical application.

Pontocaine (brand of tetracaine) and Niphanoid, trademarks reg. U.S. & Canada

Western Industrial Medical Association

Officers

DAN O. KILROY, M.D., President
3300 Third Avenue, Sacramento 17, California.

HOMER S. ELMQUIST, M.D., Vice-President
629 S. Westlake Avenue, Los Angeles 5.

EDWARD J. ZAIK, M.D., Secretary
The Pacific Telephone & Telegraph Co., 740 South Olive Street, Los Angeles 14.

CLARENCE L. LLOYD, M.D., Treasurer
Medical Director, North American Aviation, Inc., Los Angeles 45.

ELIZABETH SCHEUNER, Assistant Secretary
The Pacific Telephone & Telegraph Co., 740 South Olive Street, Los Angeles 14.

Directors—1954

PACKARD THURBER, JR., M.D.
111 West Seventh Street, Los Angeles 14, California.

CHARLES M. McGILL, M.D.
Tacoma, Washington.

Directors—1955

VERNE G. GHORMLEY, M.D.
2014 Tulare Street, Fresno, California.

DOUGLAS D. McKINNON, M.D.
Medical Square Bldg. No. 1, 2200 West Third Street, Los Angeles 5, California.

Directors—1956

FORREST E. RIEKE, M.D.
210-A N.E. Oregon Street, Portland 14, Oregon.

A. C. REMINGTON, M.D.
9851 Sepulveda Boulevard, Los Angeles 45, California.

Chairman of the Board of Directors:
CHRISTOPHER LEGGO, M.D.
California & Hawaiian Sugar Refining Corporation, Ltd., Crockett, California.

Central States Society of Industrial Medicine and Surgery

Officers

President
ELSTON L. BELKNAP, M.D., Milwaukee.
President-Elect
DONALD C. CONZETT, M.D., Dubuque.
Vice-President
J. M. L. JENSEN, M.D., Chicago.
Secretary-Treasurer
CHARLES DRUECK, M.D., 28 East Jackson Blvd., Chicago 4, Illinois.
Program Chairman
BURTON C. KILBOURNE, M.D., Chicago.
Program Co-Chairmen
JOHN R. MERRIMAN, M.D., Evanston.
PAUL J. WHITAKER, M.D., Milwaukee.

Board of Governors

1953—THOMAS C. BROWNING, M.D., Chicago.
ALVIN H. DIEHR, M.D., St. Louis.
ESLEY J. KIRK, M.D., Omaha.
VIRGIL McCARTHY, M.D., Princeton, Ind.
BURTON C. KILBOURNE, Chicago.

1954—LEONARD ARLING, M.D., Minneapolis.
LLOYD E. HAMLIN, M.D., Chicago.
ELI S. JONES, M.D., Hammond.
MILTON H. KRONENBERG, M.D., Peoria.
EMMETT B. LAMB, M.D., Indianapolis.

1955—DANIEL E. DORCHESTER, M.D., Sturgeon Bay, Wisc.
H. G. GARDNER, M.D., East Chicago, Indiana.
FRANK G. OBER, M.D., Burlington, Iowa.
EDWARD SHOWALTER, M.D., Chicago.
RICHARD A. SUTTER, M.D., St. Louis, Mo.

Component Society of the Industrial Medical Association.

tional health activities. At first he worked alone. In 1931 he was assisted by an industrial hygienist, and today the bureau has a staff of physicians, industrial engineers, nurses and chemists. During the period DR. GRAY served as Director of the bureau many pioneer investigations were carried out. Under his direction the bureau was one of the earliest agencies to utilize scientific methods in field investigations in industrial plants to uncover the causes of occupational diseases. A few of the notable accomplishments were the elimination of the use of mercury in the hatting industry, elimination by exhaust ventilation and other methods of hazardous conditions in foundries, and the attainment by the state of one of the finest industrial health records in the country during World War II. Connecticut, with its aircraft, munitions and rubber industries, was then known as the "Arsenal of Democracy." All of these industries were using processes which could have been harmful to workers' health. However through the cooperative efforts of DR. GRAY'S staff and the industries not a single case of illness due to these processes was reported in the state. Another first in industrial medicine under the aegis of DR. GRAY and his staff was the inauguration in 1946 of the "Hartford Plan." He had long believed that no industrial plant was too small for a health program. With his support and guidance, six Hartford plants, employing from 300 to 800 persons combined their resources to support an industrial medical program comparable to that found in industries employing thousands. This joint plan has been widely adopted throughout the country. For his pioneering work in the prevention of occupational illness in the state, DR. GRAY received in 1948 a citation from the Connecticut Safety Society. In 1950, DR. GRAY was advanced to Deputy Commissioner in the State Department of Health. Here again he displayed the faculty of grasping a problem and following it through to a logical conclusion. While serving as Deputy Commissioner he had much to do, in addition to his other duties, with setting up the Medical Services Section of the state's civil defense plan. DR. GRAY was the first Chairman of the Industrial Hygiene Section of the American Public Health

Florida Association of Industrial and Railway Surgeons

Officers

JOHN H. MITCHELL, M.D., President
241 W. Ashley St., Jacksonville
LLOYD J. NETTO, M.D., President-Elect
416 Coneau Bldg., West Palm Beach
P. J. MANSON, M.D., Vice-President
8037 N.E. 2nd Ave., Miami
JOHN H. MITCHELL, M.D., Secretary-Treasurer
24 W. Ashley St., Jacksonville

Directors

F. H. BOWEN, M.D.
2000 Park St., Jacksonville
V. A. LOCKWOOD, M.D.
East Coast Hospital, St. Augustine
F. D. GRAY, M.D.
12 N. Rosalind Ave., Orlando
J. C. DAVIS, M.D.
P.O. Box 465, Quincy

Component Society of the Industrial Medical Association.

Association of Mine Physicians

Officers

GEO. W. EASLEY, M.D., President
Williamson, West Virginia.
E. M. HOWARD, M.D., Vice-President,
Harlan, Kentucky.
J. C. LAWSON, M.D., Secretary-Treasurer,
Williamson, West Virginia.
W. R. LUNDY, Executive Secretary,
Offices: Williamson, W. Va.
Pineville, Ky.

Committee on Organization

R. O. ROGERS, M.D., Chairman,
Bluefield, W. Va.
C. L. HARSHBARGER, M.D., Norton, Va.
CARL E. AUSMUS, M.D., Jellico, Tenn.
J. A. BENNETT, M.D., Algoma, W. Va.
J. C. MOORE, M.D., Keen Mountain, Va.
T. M. PERRY, M.D., Jenkins, Ky.
P. E. BLACKBERRY, M.D., Louisville, Ky.
CARL A. GROTE, M.D., Huntsville, Ala.
C. N. CARRAWAY, M.D., Birmingham, Ala.

Component Society of the Industrial Medical Association.

Industrial Medical Association of Philadelphia

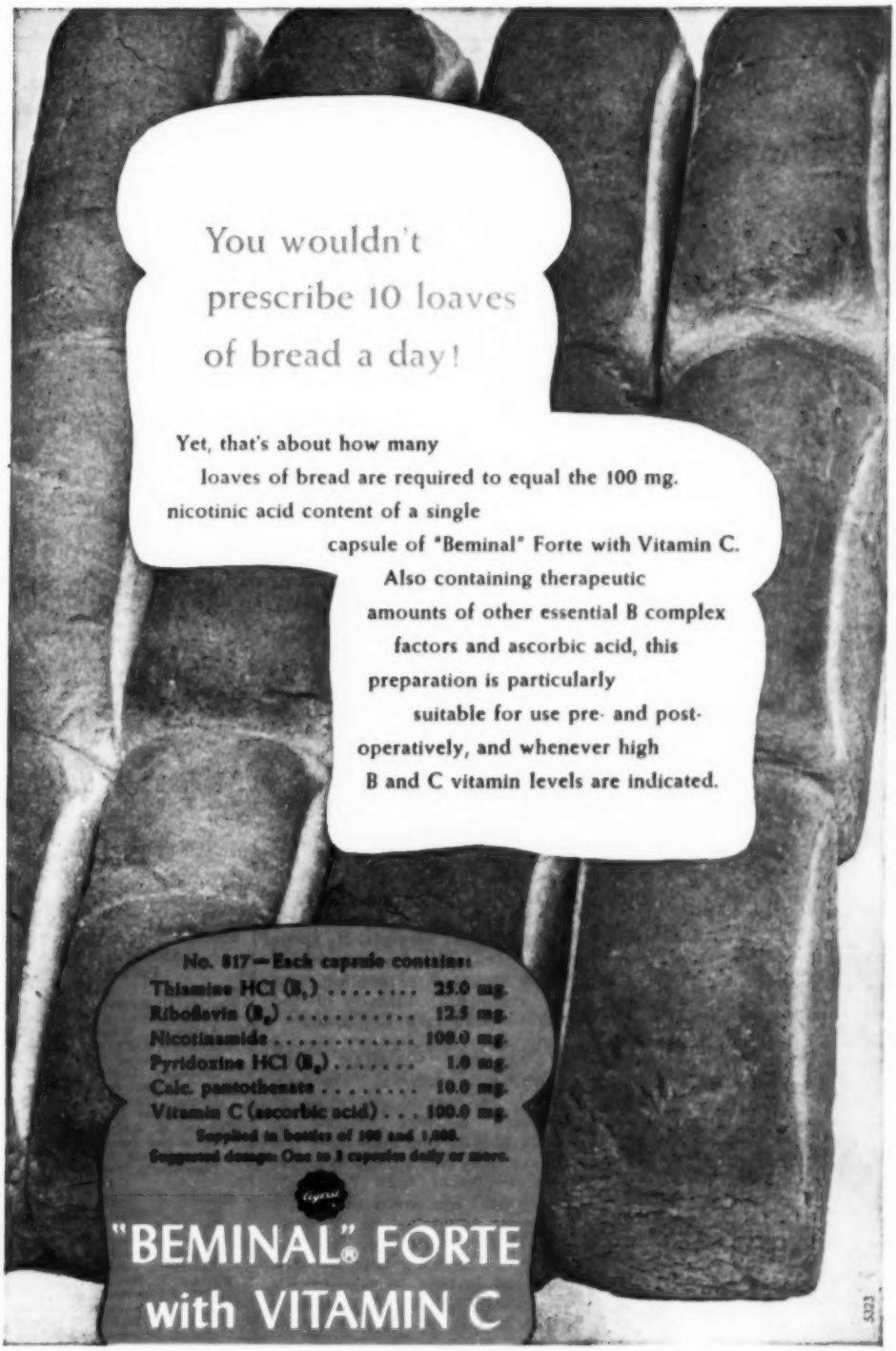
Officers

F. B. LANAHAN, M.D., President
Electric Storage Battery Company
Philadelphia
WILLIAM D. FRAZIER, M.D., President-Elect
The Baldwin-Lima-Hamilton Corp.
Eddystone, Pennsylvania
NORBERT J. ROBERTS, M.D., Secretary
Pennsylvania Railroad
1617 Pennsylvania Blvd.
Philadelphia
ALBERT J. SNYDER, M.D., Treasurer
Newton Square, Pennsylvania

Directors

HEINRICH BRIEGER, M.D.
Jefferson Medical College
Philadelphia
LAURENCE P. DEVLIN, M.D.
Philadelphia Quartermaster Depot
Philadelphia
GLENN S. EVERTS, M.D.
Curtis Publishing Company
Philadelphia
HOWARD J. JOHNSON, M.D.
Philadelphia Gas Works
Philadelphia
HAROLD LEFKOE, M.D.
John H. Mathis Company
Philadelphia
LEMUEL C. McGEE, M.D.
Hercules Powder Company
Wilmington, Delaware
ALBERT J. SNYDER, M.D.
Newton Square, Pennsylvania

Component Society of the Industrial Medical Association.


You wouldn't prescribe 10 loaves of bread a day!
Yet, that's about how many loaves of bread are required to equal the 100 mg. nicotinic acid content of a single capsule of "Beminal" Forte with Vitamin C.
Also containing therapeutic amounts of other essential B complex factors and ascorbic acid, this preparation is particularly suitable for use pre- and post-operatively, and whenever high B and C vitamin levels are indicated.
No. 817—Each capsule contains:
Thiamine HCl (B_1) ..... 25.0 mg.
Riboflavin (B_2) ..... 12.5 mg.
Nicotinamide ..... 100.0 mg.
Pyridoxine HCl (B_6) ..... 1.0 mg.
Calc. pantothenate ..... 10.0 mg.
Vitamin C (ascorbic acid) ... 100.0 mg.
Supplied in bottles of 100 and 1,000.
Suggested dosage: One to 3 capsules daily or more.
"BEMINAL"® FORTE with VITAMIN C
5323

Ayerst, McKenna & Harrison Limited, New York, N. Y. • Montreal, Canada

★ AMERICAN ASSOCIATION OF RAILWAY SURGEONS ★

Officers

President:
J. H. FRANCIS, M.D., Memphis, Tennessee.
President-Elect:
WILLIAM G. BESSMER, M.D., Davenport, Iowa.
Vice-Presidents:
MELVIN L. HOLE, M.D., Danville, Illinois.
J. RUDOLPH JAEGER, M.D., Philadelphia.
GEORGE H. WALKER, M.D., Lincoln, Nebraska.
Recorder:
JAMES K. STACK, M.D., Chicago.
Treasurer:
THEODORE L. HANSEN, M.D., 139 West Van Buren, Chicago 5, Wabash 2-3200, Ext. 220.

Executive Board

ARTHUR R. METZ, M.D., Chairman, Chicago.
RAY S. WESTLINE, M.D., Chicago.
ROBERT M. GRAHAM, M.D., Chicago.
ALEXANDER M. W. HURSH, M.D., Philadelphia.
RAYMOND B. KEPNER, M.D., Chicago.
E. C. OLSON, M.D., Chicago.

Secretary:
CHESTER C. GUY, M.D., 5800 Stony Island Ave., Chicago 37, Midway 3-9200

66th Annual Meeting, April 6-8, 1954, at the Drake Hotel, Chicago

Territorial Association of Plantation Physicians

Officers

President
WILLIAM H. WILKINSON, M.D.
Lanai City, Lanai, T.H.
Vice-President
HERBERT T. ROTHWELL, M.D.
Kahuku, Oahu, T.H.
Secretary-Treasurer
PAUL J. C. CALDWELL, M.D.
Waipahu, Oahu, T.H.
Executive Secretary
MRS. JEANNETTE WILKINSON, 1133 Punchbowl, Honolulu, Oahu, T.H.
Component Society of the Industrial Medical Association.

Industrial Medical Association of New Jersey

Officers

GEORGE A. PAUL, M.D., President
Hyatt Roller Division
General Motors Corp., Harrison
THOMAS M. THOMPSON, M.D., Vice-President
Johnson & Johnson, New Brunswick
J. H. WOLFSIE, M.D., Secretary
American Cyanamid Co., Linden
GEORGE C. FREEMAN, M.D., Treasurer
Prudential Insurance Co.
763 Broad Street, Newark

Board of Directors

RALPH A. YOUNG, M.D.
General Motors Corporation
B.O.P. Assembly Division, Linden
L. HOLLAND WHITNEY, M.D.
New Jersey Bell Telephone Company
763 Broad Street, Newark
C. S. MCKINLEY, M.D.
Bakelite Division, Bound Brook
Component Society of the Industrial Medical Association.

Chicago Society of Industrial Medicine and Surgery

Officers

GEORGE W. BOHR, M.D., President
WILL F. LYON, M.D., Vice-President
HILLS HENNAN, M.D., Program Chairman
CHARLES DRUECK, M.D., Secretary-Treasurer

Board of Directors

Terms to Expire 1953:
BURTON C. KILBOURNE, M.D.
KENNETH F. STOTZ, M.D.
DALE M. VACHOUT, M.D.
Terms to Expire 1954:
KARL G. RUNDSTROM, M.D.
CARLO SCUDERI, M.D.
EUGENE L. WALSH, M.D.
Terms to Expire 1955:
HAROLD EARNHEART, M.D.
HILLS HENNAN, M.D.
JOHN R. MERRIMAN, M.D.

Association, is a Past-President of the American Conference of Governmental Industrial Hygienists, and is certified by the American Board of Preventive Medicine and Public Health. For a number of years he has been a member of the faculty of Yale University, and counts among his former students many physicians and industrial hygienists now holding responsible positions in this field throughout the world.

JAMES N. DEWANE, M.D., mentioned here last month as having been named Medical Director of Libby, McNeill & Libby, food canners, Chicago, succeeds DR. ROSCOE C. EATON, who retired under the company's pension plan after 38 years' service. DR. DEWANE was previously affiliated with St. Agnes Hospital, Fond du Lac, Wisconsin, and Newton D. Baker General Hospital, Martinsburg, West Virginia. He spent two years in military service, attained the rank of captain, and was regimental surgeon of the 11th Constabulary Regiment.

F. BENEDICT LANAHAN, M.D., writes as follows: "On July first I was named Professor of Woman's Medical College of Pennsylvania. You may recall DR. CHARLES-FRANCIS LONG was Associate Professor here for eight years until his death in 1952. I am most conscious of the solid framework constructed here by DR. LONG'S untiring purpose. It is my good fortune to take up his work at the advanced position in which he left it. I have faced no need to persuade the college authorities of the potentialities in the field of occupational medicine. Rather, I find myself hoping I

Michigan Industrial Medical Association

Officers

SHERMAN ANDREWS, M.D., President
224 East Cedar St., Kalamazoo
LYNDLE R. MARTIN, M.D., President-Elect
The Detroit Edison Co., 2000 Second Ave., Detroit
PAUL J. OCHSNER, M.D., Vice-President
401 Verlinden Avenue, Lansing 4
W. N. SISK, M.D., Secretary-Treas.
The Upjohn Company, Kalamazoo

Board of Directors

THORNTON, I. BOILEAU, M.D., Detroit
OTTO J. PRESTON, M.D., Flint
JOSEPH L. ZEMENS, M.D., Detroit
Component Society of the Industrial Medical Association.

Association of Railway and Industrial Physicians and Surgeons of Kansas City

Officers

ROBERT A. MOORE, M.D., President
106 W. 14th St., Kansas City, Mo.
CARL H. BRUST, M.D., Vice-President
1275 W. 71st St. Terrace, Kansas City.
TERRY E. LILLY, JR., M.D., Secretary-Treasurer
807 Argyle Bldg., Kansas City, Mo.

Trustees

F. L. FRIERABEND, M.D.
IRA LOCKWOOD, M.D.
Component Society of the Industrial Medical Association.

American Association of Industrial Dentists

Officers

ERNEST G. SMITH, D.D.S., President
Dental Director, Tennessee Valley Authority, Wilson Dam, Alabama
GRANT U. MACKENZIE, D.D.S., President-Elect, Dental Director, Ford Motor Company, Dearborn, Michigan
GUY C. KIRBY, D.D.S., Treasurer
Dental Director, Pratt-Whitney Aircraft, East Hartford, Connecticut
EDWARD R. ASTON, D.D.S., Secretary
Industrial Dental Consultant
Pennsylvania Department of Health
Harrisburg, Pennsylvania

Directors

FRANCIS J. WALTERS, D.D.S., Chairman
Senior Dental Surgeon, U.S. Public Health Service, Washington 25, D.C.
RICHARD V. WILLS, D.D.S., 1954
Dental Director, Farm Bureau Insurance Company, Columbus, Ohio
HOWARD E. DECAMP, D.D.S., 1955
Dental Director, Corning Glass Works, Corning, New York
DONALD W. HENRY, D.D.S., 1955
Dental Director, Molson's Brewery, Montreal 25, Canada
KENNETH W. MISHER, D.D.S., 1956
Dental Director, International Harvester Company, 185 North Wabash Avenue, Chicago, Illinois

Waterproof Protection
AGAINST CONTACT DERMATITIS

. . . new plasticized cream resists washing, lasts longer

INDICATIONS: Protection of skin from *industrial dermatoses*, such as sensitivity to chemicals, paints, dyes and cutting oils; *household skin allergies*, such as soap and water dermatitis and sensitivity to cosmetics, clothing dyes, solvents, cleaning and polishing agents; *professional allergies* to procaine, penicillin, detergents and various laboratory solutions; *post-surgical reactions* to excoriating body fluids; and *irritation by scratching* of dry eczematous or neurodermatitic lesions.

CONTRAINDICATIONS: None except premature application on wet, exudative lesions.

APPLICATION: Twice daily for 10 days to two weeks to build up protective layer. Continued protection can then be maintained with a single application every one or two days. Massage into skin gently and over entire area; avoid actual rubbing in any one region; smooth in until no longer visible. When used on hands, apply also under fingernails.

HOW SUPPLIED: By pharmacies in one-ounce tubes with slip-off labels; also in one-pound jars.

No need for six or eight different skin creams to suit individual conditions—with Covicone Cream, a single product provides protection against a wide variety of sensitizing agents from corrosive industrial materials to common household allergens. Resisting removal by ordinary washing, Covicone is especially useful where prolonged or continuous protection is desired, as in cases of occupational nature. Invisible, plastic-like coating maintained with infrequent applications. In vanishing cream base, Covicone is not sticky or greasy. Abbott

COVICONE
CREAM

(Abbott's Protective Skin Cream)

can measure up to their expectations. In addition to teaching, the appointment carries responsibilities to develop a service to the adjacent industries. Such a service the college recognizes as a community obligation. My association with the Electric Storage Battery Corporation has been that of Consulting Medical Director and involves spending half my time in the general offices and plants of this company. I look on my situation as that of a working professorship and believe it will be most feasible."

THE Industrial Medical Association of the Province of Quebec and the Industrial Section of the Ontario Medical Association will hold a joint meeting in Quebec City, October 1 and 2, 1953. All physicians and surgeons with full-time or part-time industrial affiliations are welcome; they are promised an interesting, informative and pleasant two days. Reservations may be made at the Chateau Frontenac, Quebec, P.Q.

W. T. MCCORMICK, Assistant Superintendent, Occupational Hygiene, Inland Steel Company, East Chicago, Indiana, on June 1, 1953, was appointed Assistant Director of the Medical Department, in charge of Occupational Hygiene.

AMERICAN Fracture Association will hold its Fourteenth Annual Meeting at Mission Inn, Riverside, California, October 12 to 15, 1953. The preliminary program lists 33 topics, names 33 speakers. HENRY W. MEYERDING, M.D., is President of the Association; H. W. WELLMERLING, M.D., is Secretary-General.

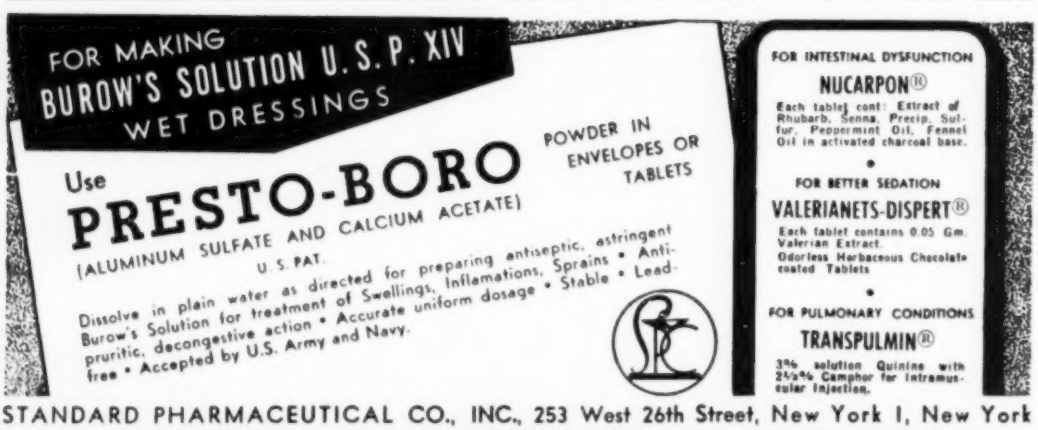
Free Speech

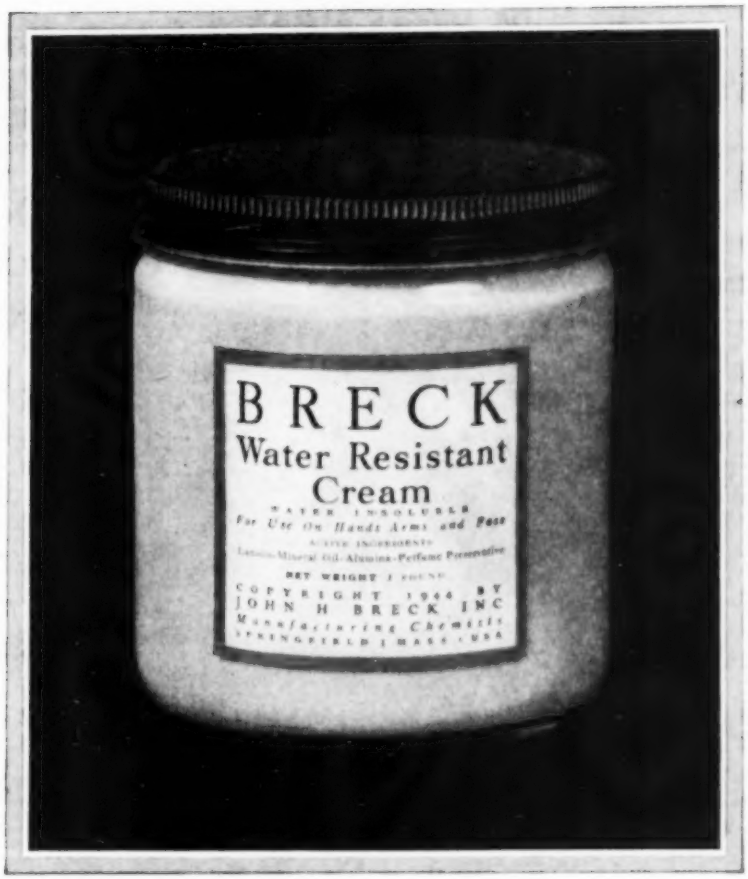
WHEN the issue of management's right to free speech in relation to labor relations was decided by the Supreme Court, a cynical pork chopper was quoted as having said: "Give 'em free speech; they don't know what to do with it." Often it looks as though he were right.

—W. E. SHURTLEFF, Director of Industrial Relations, Standard Products Company.

Deaths

COLONEL WESLEY C. COX, MC, USA, in Richmond, Virginia, May 22, 1953, following a cerebral hemorrhage. At the time of his death COLONEL COX was Commanding Officer of the Army Environmental Health Laboratory at the Army Chemical Center, Edgewood, Maryland. He was on leave when stricken. Born in New York City, April 21, 1891, COLONEL COX graduated from Columbia University (A.B. 1913) and the College of Physicians and Surgeons, New York (M.D., 1916). Subsequently he took graduate training at the Army Medical School, Washington, D.C., and Johns Hopkins University (Doctor of Public Health, 1940). He began his Army career in 1917 when he joined the Medical Corps Reserve as Frst Lieutenant. The following year he was commissioned First Lieutenant in the Regular Army. During his 36 years of service he held posts as Chief of the Laboratory, Camp Jackson, South Carolina; Epidemiologist, Fort Dix, New Jersey; Serologist and Chief, Laboratory, Eighth Corps Area; Chief, Laboratory and Medical Inspector, Fort Leavenworth, Kansas. Between other assignments he was bacteriologist, serologist and instructor at the Army Medical School, Washington, D. C., and bacteriologist and instructor, Walter Reed General Hospital. A number of years of service were spent in the Panama Canal Department where he began his first tour of duty as bacteriologist in 1922. Leaving in 1925 he returned in 1939 to spend seven more years in the Canal Zone, first as medical inspector, then assistant department surgeon, and finally as surgeon. His other chief post outside the United States was as assistant surgeon, Headquarters Caribbean Command. In 1946 he was called to head up the Army Industrial Hygiene Laboratory, and in 1948 was designated as Consultant to the Surgeon General on Occupational Health and Hygiene holding both positions until the time of his death. COLONEL COX was a Fellow of the American College of Physicians the American Medical Association, American Public Health Association and the American Geriatrics Association, and was certified by the American Board of Preventive Medicine. He held memberships in the American Society of Tropical Medicine and Hygiene, Industrial Medical Association, American Industrial Hygiene Association, and the Association of Military Surgeons. He was awarded the Legion of Merit by the Caribbean Defense Command, in 1945, for his work on sanitation and disease control, and the Army Commendation Ribbon in 1943, for his health education activities in the Canal Zone. In 1946 he was honored by the President of Panama with the Order of Vasco Nunez de Balboa, Grade of Commander.


FOR MAKING
BUROW'S SOLUTION U.S.P. XIV
WET DRESSINGS
Use
PRESTO-BORO
(ALUMINUM SULFATE AND CALCIUM ACETATE)
U.S. PAT.
POWDER IN ENVELOPES OR TABLETS
Dissolve in plain water as directed for preparing antiseptic, astringent Burow's Solution for treatment of Swellings, Inflamations, Sprains • Antipruritic, decongestive action • Accurate uniform dosage • Stable • Lead-free • Accepted by U.S. Army and Navy.
FOR INTESTINAL DYSFUNCTION
NUCARPON®
Each tablet cont: Extract of Rhubarb, Senna, Precip. Sulfur, Peppermint Oil, Fennel Oil in activated charcoal base.
FOR BETTER SEDATION
VALERIANETS-DISPERT®
Each tablet contains 0.05 Gm. Valerian Extract.
Odorless Herbaceous Chocolate coated Tablets
FOR PULMONARY CONDITIONS
TRANSPULMIN®
3% solution Quinine with 2½% Camphor for Intramuscular Injection.
STANDARD PHARMACEUTICAL CO., INC., 253 West 26th Street, New York 1, New York



B R E C K

WATER RESISTANT CREAM

Breck Water Resistant Cream, when applied to the skin, forms a protective film which is resistant to the action of water and water solutions. It spreads easily, leaving a protective film which is not slippery, sticky or "heavy". Breck Water Resistant Cream is recommended for the industrial and professional worker whose skin is frequently in contact with water or water solutions, such as liquid coolants, emulsified cutting oils, mist and spray from alkali baths and plating solutions, flux fumes, cement and lime. An application of Breck Water Resistant Cream is effective for three to four hours.

A Breck Industrial Preparations Booklet will be forwarded to you upon request.

JOHN H BRECK INC MANUFACTURING CHEMISTS · SPRINGFIELD 1 MASSACHUSETTS
NEW YORK · CHICAGO SAN FRANCISCO · OTTAWA CANADA

Industrial Medical and Related Chronology selected and arranged by ROBERT T. LEGGE, M.D., F.A.C.S., Berkeley, California.

"Look to your health; and if you have it, praise God, and value it next to a good conscience, for health is the second blessing that we mortals are capable of—a blessing that money cannot buy." —Isaak Walton

♍ = Virgo — August 22-September 22

1953 SEPTEMBER

SEPTEMBER (Circa)

1910—First National Conference on Industrial Diseases met at Chicago. President H. W. Farnam, of Yale University, in the opening address uttered these immortal words: "In this warfare against industrial diseases we need the operation of many different people. This is a warfare in which science, labor, business enterprises, and government must all unite."
1910—Wainwright Commission of New York investigated abuses in settlements of industrial injuries to employees.
1918—Dr. Leroy Gardner of the Saranac Laboratories of the Trudeau Foundation began extensive research on tuberculosis and pneumonoconiosis.
1919—Harvard Medical School conferred the first degree in industrial hygiene, the recipient being Dr. Clarence O. Sappington, of Chicago.

"Experience may be the best teacher, but some of us are poor pupils. I know a physician who practiced to a very advanced age and was revered for his enormous experience. That man had made the same mistakes every year for 60 years—and everybody called it experience"

—From "Dr. W. I. Royster's Medical Maxims," by Hubert A. Royster, M.D., in North Carolina Med. J., July, 1953.

☽ 1st Quar. ○ Full Moon ☾ 4th Quar. ● New Moon

1 ♍ Tu
1950—George Rosen, distinguished medical historian, author of the "History of Miners' Diseases," appointed Professor of Public Health at Columbia University.
"There is nothing more likely to betray a man into absurdity than condescension"—Samuel Johnson

2 ♍ W
1911—Charles R. Greenleaf, Medical Inspector, M.C., U.S.A., and veteran of Civil and Spanish-American Wars, died at San Jose, California.
1737—Luigi Galvini, Professor of Anatomy at Bologna, Italy, born. Discoverer of galvanic electricity.

3 ♍ Th
1643—Lorenzo Bellini, Italian physician and professor at Pisa, born at Florence. Distinguished for his anatomical researches of the kidney. The tubes of Bellini are named after him.
"Who dares nothing need hope for nothing"—Schiller

4 ♍ Fr
1893—Lyman D. Hancock, D.D.S., born in San Francisco. Chief of the Dental Division, U.S.P.H.S., Washington, D.C.
1789—Alexander Hodgdon Stevens born in New York City. Professor of Surgery, College of Physicians and Surgeons; ex-president, A.M.A.; and Academy of Medicine, New York.

5 ♍ Sa
1902—Rudolph Virchow, Professor at University of Berlin, founder of cellular pathology, and author, died at Berlin. First clearly to describe thrombosis and embolism.
1894—H. L. F. von Helmholtz, noted German physician and physicist, died at Berlin. Inventor of the ophthalmoscope.

6 ♍ S
1766—John Dalton, philosopher and chemist, born at Cumberland, England. Perfected the atomic theory. First to describe color blindness which was called Daltonism.
1677—Stephen Hales, English physiologist and inventor in ventilation, born at Baersbourne, Kent.

7 ♍ M
1922—William S. Halstead, Professor of Surgery, Johns Hopkins University, Master Surgeon, original investigator and creator of many operative techniques, died at Baltimore.
"It is hard for an empty bag to stand upright"—Franklin

8 ○ Tu
1749—Sir Gilbert Blane, a Scotch physician and British naval officer, advocated lemon juice to prevent scurvy. Author of "Observations on Diseases of Seamen," and a book on "Elements of Medical Logic." Born at Blanefield, Scotland.

9 ♍ W
1770—Bernard Siegfried Albinus, Professor of Anatomy, Surgery, and Medicine at Leyden, died. Famous for his anatomical drawings; first to show by injection the vascular system of mother and fetus.
1891—California Academy of Medicine officially organized.

10 ♍ Th
1730—Joseph G. Duverney, Professor of Anatomy in Paris, died. Made important investigations of the inner structures of the ear, and wrote the first treatise on otology.
"We should not impute the faults of the physician to his art"—Celsus

11 ♍ Fr
1818—John Marshall, English anatomist and surgeon, born at Ely, Cambridgeshire. Professor of Surgery, University College; President of Royal College of Surgeons.
"Glory is nothing more than oblivion postponed"—Raymon Y. Cajal

12 ♍ Sa
1860—Rudolf Matas born at Bonne, Louisiana. Professor of Surgery, Tulane University, Ex-President, A.C.S. Distinguished in the surgery of blood vessels.
"Keep thy tongue from evil and thy lips from speaking guile"—Psalms XXXIV, 13

♎ = Libra — September 23-October 22

13 ♍ S
1900—Jesse W. Lazear, M.C., U.S.A., bitten by infected mosquito, five days later developed yellow fever, and died at Havana. A true martyr to science.
1858—Carl H. von Noorden born at Bonn on Rhine. Professor of Medicine at Frankfort.

14 ♍ M
1769—Alexander von Humbolt born at Berlin. Scientist and author; described choke and fire damp; developed a gas mask and safety lamp.
"We grow neither better nor worse as we get old, but more like ourselves"—Becker

15 ♍ Tu
1923—At Stockholm Frederick G. Banting and J. J. R. Macleod of Toronto, discoverers of insulin, received the Nobel Prize in Medicine.
"The worse crime against the working people is a company which fails to operate at a profit"—Gompers

16 ☽ W
1853—Allrecht Kossel, German physiologist, Professor at Heidelberg, born. Recipient of Nobel Prize for achievements in the chemistry of the cell.
"In order to have an enemy, one must be somebody"—Swetchine

17 ♍ Th
1873—Johna N. Czernak, Professor of Physiology at Leipsic, died at Karlsbad. He founded a new specialty, laryngoscopy; developed a mirror for inspecting larynx.
"My idea of an agreeable person is a person who agrees with me"—Disraeli

18 ♍ Fr
1821—Jean Nicholas Corvisart, noted French physician and teacher and Napoleon's physician, died at a suburb of Paris. Author of "Essay on the Heart and Blood Vessels."
"Things don't turn up in this world until somebody turns them up"—Garfield

19 ♍ Sa
1921—Dedication ceremonies took place at the Peking Union Medical College. General Leonard Wood and Dr. W. H. Welsh presented addresses.
"A man who has committed one mistake and doesn't correct it, is committing another"—Confucius

20 ♍ S
1808—Henry Gibbons, pioneer physician at San Francisco, founder of the California Medical Society and professor in the first medical college on the Pacific Coast, later Cooper Medical College, born at Wilmington, Delaware.
"Though always in haste, I am never in a hurry"—Wesley

21 ♍ M
1952—Fenn E. Poole, Medical Director at Lockheed Aircraft Corporation, killed in an auto collision at Los Angeles. Second Vice-President, I.M.A.; authority in aero medicine.
"Speaking much is a sign of vanity, for he that is lavish in words is a niggard in deeds"—Sir Walter Raleigh

22 ○ Tu
1810—Dr. John Brown, student of James Syme, born at Lanarkshire. Author of the famous dog story 1858 "Rab and his Friends."
130—Galen born at Pergamum.
1900—Major Walter Reed, M.C., U.S.A., died.

23 ♎ W
1738—Herman Boehaave, famous Dutch professor of medicine, botany, and chemistry, died at Leyden. Author of many medical works and master clinician.
"The art of medicine is to be properly learned only from the practice and exercise"—Sydenham

24 ♎ Th
1541—Paracelsus (Theophrastus Bombastus von Hohenheim) died at Salzburg. Swiss physician, precursor of chemical pharmacology and therapeutics. Author—Von der Bergsucht. Describes miners' phthisis and choke damp as occupational diseases. Original thinker of the Sixteenth Century.

25 ♎ Fr
1886—Carey Pratt McCord, distinguished in toxicology, research, and industrial medicine, born in Bibb County, Alabama. Recipient Knudsen Award; Editor, *Industrial Medicine and Surgery;* associated with Institute of Industrial Health, University of Michigan

26 ♎ Sa
1863—Alexander E. J. Yersin, a bacteriologist, born at Rougemont, Switzerland. Shared honors with Roux at Pasteur Institute for discovery of diphtheria serum, and with Kitasota in discovering plague bacillus.
"And what so tedious as a twice-told tale"—Pope

27 ♎ S
1869—Francis Marian Pottenger born in Sather, Ohio. Medical Director of Pottenger Sanitarium at Monrovia, California; national authority on tuberculosis.
"In youth we say: 'I am immortal.' In age we say 'I die without having lived'"—Ramon Y. Cajal

28 ♎ M
1789—Richard Bright, noted English physician for his researches on the pathology of nephritis (called it Bright's Disease) born at Bristol.
1870—William Allen Miller, F.R.S., physician and chemist, died at Liverpool. Discoverer of spectrum analysis.

29 ☾ Tu
1859—Herman M. Briggs, famous American bacteriologist and pathologist, born at Trumansburg, New York. Established first bacteriological laboratory, New York Health Department of Medical Research, Rockefeller Institute.
"In youth and beauty wisdom is but rare"—Pope

30 ♎ W
1894—Alfred H. Whittaker of Detroit born at Portsmouth, Ohio. Past-President I.M.A.; industrial bibliophile and medical historian.
"A little group of wise hearts is better than a wilderness of fools"—Ruskin

Improper amounts or unbalanced combinations of nutrients tend to disturb the nutritional balance. Balanced nutrition is achieved only when the daily requirements of all nutrients are supplied every day.

When you prescribe VITERRA, your patients receive adequate amounts of Vitamins, Minerals and Trace Elements for protection against dietary deficiencies.

To maintain better balance in nutrition,

Viterra ALL IN ONE CAPSULE

Vitamin A	5,000 U.S.P. Units	Calcium	213 mg.
Vitamin D	500 U.S.P. Units	Cobalt	0.1 mg.
Vitamin B_{12}	1 mcg.	Copper	1 mg.
Thiamine Hydrochloride	3 mg.	Iodine	0.15 mg.
Riboflavin	3 mg.	Iron	10 mg.
Pyridoxine Hydrochloride	0.5 mg.	Manganese	1 mg.
Niacinamide	25 mg.	Magnesium	6 mg.
Ascorbic Acid	50 mg.	Molybdenum	0.2 mg.
Calcium Pantothenate	5 mg.	Phosphorus	165 mg.
Mixed Tocopherols (Type IV)	5 mg.	Potassium	5 mg.
		Zinc	1.2 mg.

J. B. ROERIG AND COMPANY • Chicago 11, Illinois

STOP
contact dermatitis

with dramatically different

Pro·derna
trade mark

52.5% **silicone** skin protective cream

Pro-derna protects sensitive skin against the ravages of soap, water, alkalis and numerous other household and industrial irritants.

CLINICAL TESTS prove that one application of *Pro-derna* protects the skin for hours against housewives' eczema, diaper rash, industrial dermatitis, etc. Non-irritant and non-sensitizing.

NON-GREASY, non-sticky; does not interfere with use of hands. Easily removed when not needed.

samples for your own or patient use... write...

in one oz. tubes

WESTWOOD PHARMACEUTICALS
division of Foster-Milburn Co.
PT. 1M 468 Dewitt St., Buffalo 13, N.Y.

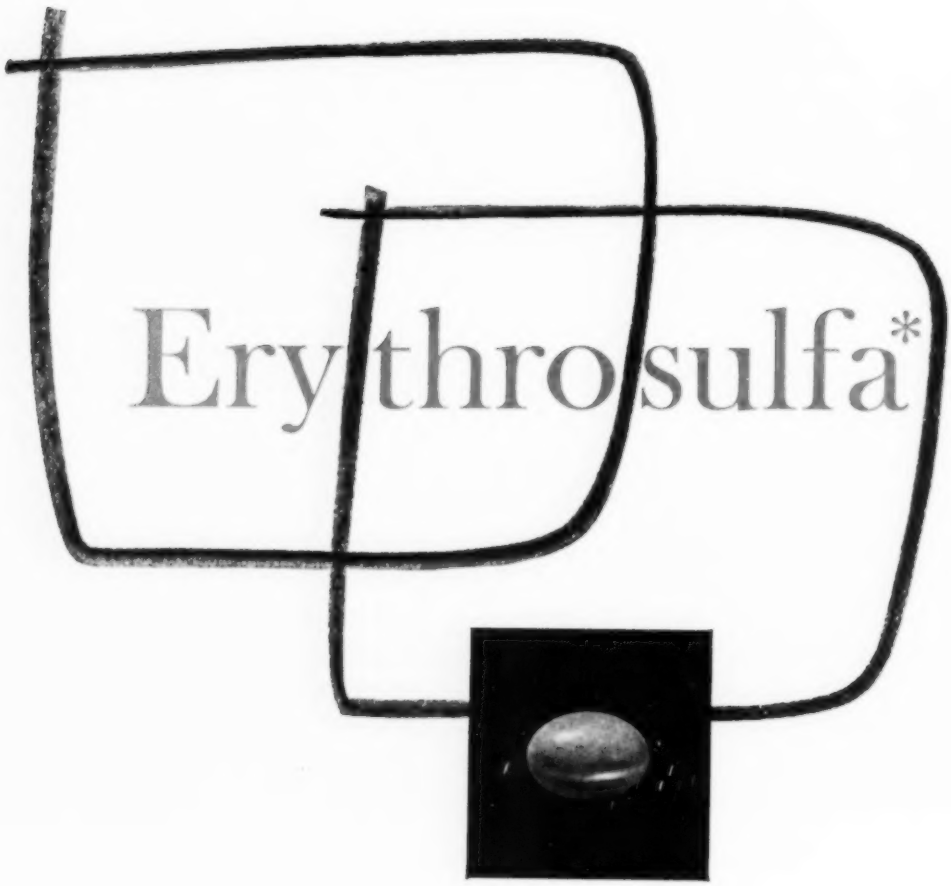
Upjohn

announcing... a new, reinforced antibacterial preparation

Erythrosulfa*

erythromycin + triple sulfonamides for combined antibiotic-chemotherapeutic effect in common infections

*TRADEMARK



Upjohn

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

antibiotic action

+

chemotherapeutic effect

to forestall resistance

"...resistant mutants have a negligible probability of emerging from a sensitive strain in the presence of effective concentrations of two chemotherapeutics with different modes of action..."[1]

formula: *each tablet contains*

Erythromycin . . . . . 100 mg.
Sulfadiazine . . . . . 0.083 Gm.
Sulfamerazine . . . . . 0.083 Gm.
Sulfamethazine . . . . 0.083 Gm.

dosage:

2 tablets every 6 hours.
In severe infections, dosage may be increased to 4 or 5 tablets every 6 hours.

supplied: Bottles of 50

1. Davis, B. D.: Pub. Health Rep. 67: 376-379 (April) 1952.

erythromycin

+

triple sulfonamides

to enhance therapeutic effect

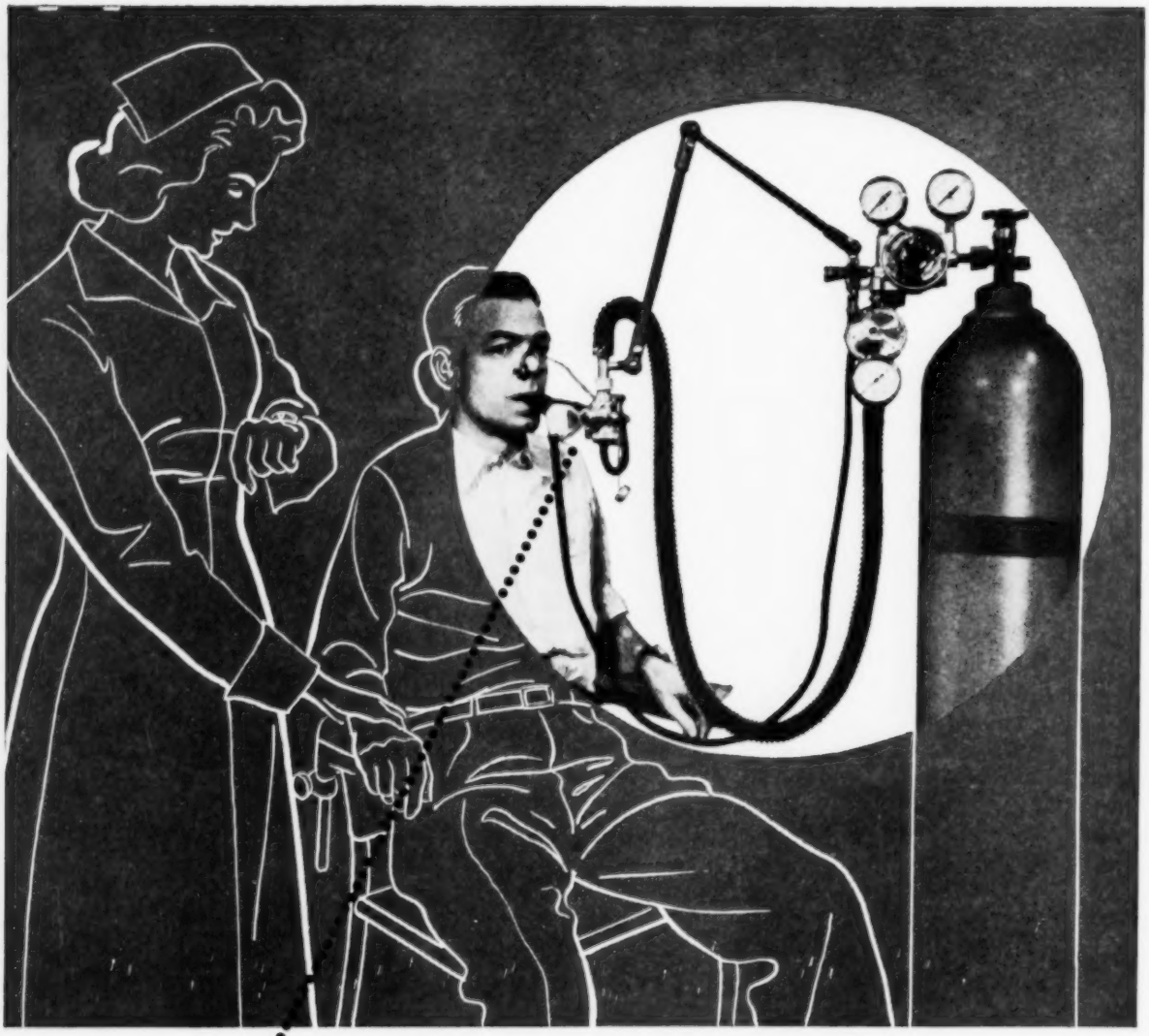
reinforced action, especially against Gram-positive bacteria susceptible to erythromycin (notably staphylococci, streptococci, pneumococci), plus protection against common Gram-negative infections.

indicated in

infections resistant to penicillin and other antibiotics.

Gram-positive infections, especially those due to staphylococci, streptococci, and pneumococci (e.g., pneumonia, pharyngitis, tonsillitis, scarlet fever, erysipelas, osteomyelitis, pyoderma).

mixed infections, including those of the urinary and respiratory tracts.



for Symptomatic relief of Bronchospasm

. . . the M·S·A PULMONARY VENTILATOR

Here's a modern instrument designed *specifically* for intermittent positive pressure therapy. Clinically proved, the M.S.A. Pulmonary Ventilator assures effective distribution of aerosols, such as bronchodilators and bacterio-static agents, throughout the respiratory tract. The unit can be used on any standard oxygen cylinder. Its ease of operation permits quick and efficient application in hospitals, doctors' offices, or in the patient's home under the physician's directions.

Our bulletin describes the instrument's many uses in inhalational therapy—operating features—ease of maintenance. Write for your copy today. Price of M.S.A. Pulmonary Ventilator with mouthpiece assembly and Nebulizer attachment—$195.00.

MSA
SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY

Braddock, Thomas and Meade Streets
Pittsburgh 8, Pa.

At Your Service:
82 Branch Offices in the United States and Canada

when endocrine readjustment is a key to well-being

Pfizer

Syntex

you can now specify Pfizer Syntex oral, transmucosal and injectable preparations of androgens, estrogens, progesterone and combinations widely useful in practice today

Arrangements recently completed between Chas. Pfizer & Co., Inc., and Syntex, S.A., now make possible a complete line of steroid hormone preparations available from PFIZER LABORATORIES. On the facing page are listed the initial groups of Pfizer Syntex preparations you can now specify, including Neodrol,* the newest agent for anabolic effect and tumor-suppression in selected cases with minimal virilizing side effects.

Research, discovery, development and wide clinical acceptance have distinguished Pfizer antibiotic agents, so often the choice of physicians in the control of infectious disease. The scientific research facilities and production controls of both Pfizer and Syntex assure the unsurpassed purity, potency and clinical excellence of the steroid hormone preparations supplied by PFIZER LABORATORIES.

Additional information on these specialties and their roles in your practice may be obtained by writing directly to Medical Service Department, PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., 630 Flushing Avenue, Brooklyn 6, N.Y.

*TRADEMARK

Pfizer

SYNANDROTABS*	Methyl Testosterone, U.S.P., Tablets 10 mg. and 25 mg.
SYNANDRETS*	Testosterone, U.S.P., Transmucosal Tablets 10 mg. and 25 mg.
SYNANDROL*	Testosterone Propionate, U.S.P., in Sesame Oil 25 mg., 50 mg. and 100 mg. per cc.; in single-dose disposable STERAJECT® cartridges and in 10 cc. multiple-dose vials
SYNANDROL*-F	Testosterone, U.S.P., in Aqueous Suspension 25 mg., 50 mg. and 100 mg. per cc.; in 10 cc. multiple-dose vials
DIOGYNETS*	Estradiol, U.S.P., Transmucosal Tablets 0.125 mg., 0.25 mg. and 1.0 mg.
DIOGYN*-E	Ethinyl Estradiol Tablets 0.02 mg., 0.05 mg. and 0.5 mg.
DIOGYN*	Estradiol, U.S.P., in Aqueous Suspension 0.25 mg. and 1.0 mg. per cc.; in single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
DIOGYN*-B	Estradiol Benzoate, U.S.P., in Sesame Oil 0.33 mg. and 1.0 mg. per cc.; in 10 cc. multiple-dose vials
ESTRONE	Estrone, U.S.P., in Aqueous Suspension 2 mg. and 5 mg. per cc.; in 10 cc. multiple-dose vials
SYNGESTROTABS*	Ethisterone, U.S.P., Tablets 10 mg., 25 mg. and 50 mg.
SYNGESTRETS*	Progesterone, U.S.P., Transmucosal Tablets 10 mg., 20 mg. and 50 mg.
SYNGESTERONE* IN SESAME OIL	Progesterone, U.S.P., in Sesame Oil 10 mg., 25 mg., 50 mg. and 100 mg. per cc.; in single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
SYNGESTERONE* IN AQUEOUS SUSPENSION	Progesterone, U.S.P., in Aqueous Suspension 25 mg. and 50 mg. per cc.; in 10 cc. multiple-dose vials
COMBANDRIN*	Estradiol Benzoate, U.S.P., 1 mg. and Testosterone Propionate, U.S.P., in Sesame Oil 20 mg. per cc. In single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
COMBANDRETS*	Estradiol, U.S.P., 1 mg. and Testosterone, U.S.P., 10 mg. per Transmucosal Tablet
NEODROL*	Stanolone in Aqueous Suspension 50 mg. per cc.; in 10 cc. multiple-dose vials

*TRADEMARK

PFIZER LABORATORIES *Brooklyn 6, New York*

DIVISION, CHAS. PFIZER & CO., INC.

BE A BETTER BREAKFAST BOOSTER IN YOUR COMMUNITY

Young Women Eat Better Breakfast, According To Cereal Institute Study

CHICAGO — An improvement in the amount of breakfast eaten by young women is reported by the Cereal Institute, Inc., here, from a survey conducted by Elmo Roper.

Questioning 3,489 women between the ages of 20 and 35, the research organization found that 53 per cent reported they had had two or more solid foods to eat for breakfast. In 1949, the percentage giving this answer was 50. Twenty-nine per cent last year reported they had one solid and 17 per cent no solid food at all.

Also, 38 per cent of young women last year estimated they got 25 per cent or more of their daily nourishment at breakfast, compared to 31 per cent giving this answer in 1949.

The Roper survey reports "there is good acceptance of the idea that people need three regular meals a day—when they are talking about their husbands or their children."

HISTORY OF BETTER BREAKFASTS

In 1943 when the Cereal Institute was established, a study was made of what had been done in the past to promote Better Breakfast habits because with the shift over the years of the population from rural to urban living a change in eating habits took place. It was found that in 1917 during World War I that Uncle Sam had promoted this idea for war production morale purposes. But from 1917 to 1943 we find a big gap wherein the subject was given little or no attention. During World War II Uncle Sam again promoted Better Breakfasts with the slogan "Eat a Better Breakfast and Do a Better Job" and the Walt Disney poster slogan, "You Can't Breakfast Like a Bird and Work Like a Horse." At this time the Cereal Institute cooperated with this program on the national, state, and community levels. When the war was over the government dropped its Better Breakfast Program and the Cereal Institute picked up the Better Breakfast ball and has been carrying it ever since.

The Cereal Institute until recently was alone in planning research, educational, and publicity programs to promote the Better Breakfast Program. Now there are many on the Breakfast Bandwagon and the more the merrier because all doing so are making an important contribution to the betterment of the nutritional health of the nation.

Breakfast Research Grants

Over the years the Cereal Institute has provided research grants to Purdue University, Harvard University, University of Georgia, and the School of Medicine of the State University of Iowa. The purpose of these grants in the main was to explore breakfast eating habits. The Iowa Breakfast Studies have demonstrated that Better Breakfast habits are essential for maximum efficiency, both mental and physical, during late morning hours, that good breakfast habits are beneficial and that a basic cereal breakfast is a sound one.

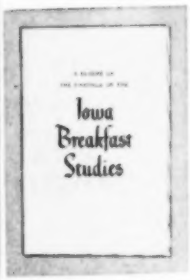
Third Annual Event

September, when eating habits are re-established for the school and work days ahead, was selected as the ideal month by professional leaders for the promotion on a nation-wide basis to improve breakfast eating habits. This nation-wide event was stimulated by the fact that over 100 cities and towns and several state-wide Better Breakfast Programs have been organized in recent years. This September the third annual Better Breakfast Month is being launched as a contribution to the betterment of the nutritional health of the country.

It's good news that Better Breakfast habits are in the making but more Better Breakfast Boosters are needed because only one out of five children goes to school with a good breakfast. Sixty per cent of teen-age girls neglect breakfast. Sixty per cent of adult women and over 40 per cent of the men skip or skimp on breakfast. You will do a service to your community to promote Better Breakfasts.

THREE CURRENT SCIENTIFIC BREAKFAST REPORTS

Findings of Iowa Breakfast Studies Reports

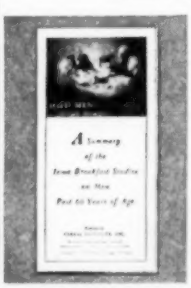


Free copies of this interesting 12 page resume booklet are available to you on your letter of request to the Cereal Institute. It describes carefully the effects of altered breakfast habits on both college men and women over a three year period.

Booklet Offered in Cooperation with Weight Control Program

The subject matter in this 24 page attractively illustrated booklet is based on current scientific and library research and is edited by a leading authority. It is available free on your letter of request, and you may have 25 free copies for office use.

Summary of the Iowa Breakfast Studies on Aged Men



This 12 page booklet summarizes the carefully controlled studies on the effects of altered breakfast habits on a group of men 60 to 80 years of age. A free copy is available to you on your letter of request. If you desire 25 for staff or office use please so state in your letter.

CEREAL INSTITUTE, INC.
135 South LaSalle Street, Chicago 3, Illinois
A Research and Educational Endeavor Devoted to the Betterment of National Nutrition

cortisone + SCHERING = Cortogen

the symbol SCHERING denotes leadership in steroid hormone research and manufacture -- including Cortogen in the most useful clinical forms. For systemic therapy, use Cortogen tablets SCHERING or injection . For eye disorders use Cortogen ophthalmic suspension -- sterile . The Schering seal SCHERING appears on each tablet and package -- your assurance of quality.

CORTOGEN®

Acetate (cortisone acetate, Schering) Tablets, 5 mg. and 25 mg.;
Injection, 25 mg. per cc., 10 cc. multiple-dose vials;
Ophthalmic Suspension – *Sterile*, 0.5% and 2.5%, 5 cc. dropper bottles.

Schering CORPORATION · BLOOMFIELD, NEW JERSEY
In Canada: Schering Corporation, Ltd., Montreal.

CORTOGEN

SCHERING

introducing

Cortef*

for topical anti-inflammatory therapy of dermatitis

A completely new approach to the management of dermatitis has been achieved. Upjohn scientists have developed Cortef Acetate Ointment for the application of the most active adrenal steroid —compound F—into affected skin layers.

Up to now, the conventional treatment of dermatitis has been primarily empirical and symptomatic (e.g., calamine for pruritus). Cortef Acetate Ointment offers a new approach through its anti-inflammatory effect. It permits the full utilization of the anti-inflammatory activity of compound F (hydrocortisone) at the tissue level without producing systemic effects.

Unlike cortisone, compound F (hydrocortisone) is effective on the skin. Results are often immediate and striking: lesions turn pale and flat; erythema, edema, and infiltration subside. And in the many instances where atopic dermatitis is self-limited, quick suppression of symptoms with Cortef Acetate Ointment may prove tantamount to cure.

Even cases refractory for years or decades to other forms of treatment have been reported yielding to the new hormonal therapy with Cortef Acetate Ointment.

acetate ointment Upjohn

(BRAND OF HYDROCORTISONE ACETATE)

SUPPLIED:

Cortef Acetate Ointment is available in 5 Gm. tubes in two strengths—2.5% concentration (25 mg. per Gm.) for initial therapy in more serious cases of dermatitis, and 1.0% concentration (10 mg. per Gm.) for milder cases and for maintenance therapy.

ADMINISTERED:

A small amount is rubbed gently into the involved area one to three times a day until definite evidence of improvement is observed. The frequency of application may then be reduced to once a day or less, depending upon the results obtained.

* *Trademark*

A product of **Upjohn Research** *for medicine . . . produced with care . . . designed for health*

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

8 good reasons for using 'POLYSPORIN'®

POLYMYXIN B—BACITRACIN OINTMENT

1. ANTI-GRAM-NEGATIVE AND ANTI-GRAM-POSITIVE

Combines the bactericidal activity of 'Aerosporin'® Sulfate Polymyxin B Sulfate against gram-negative bacilli with that of bacitracin against gram-positive organisms.[1,2] Their effects are completely additive.[3]

2. ANTI-PSEUDOMONAS

'Aerosporin' is the most effective therapeutic agent known against *Pseudomonas* (*pyocyaneus*).[6] *Pseudomonas* organisms commonly gain access to skin and lesions from the air and occasionally from instruments, dressings and drug solutions.[7]

3. MINIMAL SENSITIZATION

'Aerosporin' and bacitracin have low indices of allergenicity; an important advantage over penicillin, streptomycin, and sulfonamides.[5,6]

4. NO DAMAGE TO TISSUES

In concentrations used locally the antibiotics do not damage tissue or blood cells—compare this with the effects of chemical antiseptics.[5,7,8]

5. NEGLIGIBLE ABSORPTION

Systemic absorption of 'Aerosporin' or bacitracin from intact skin, mucous membranes, or lesions of either is practically nil.[5,8]

6. RAPID DRUG RELEASE FROM BASE

Non-aqueous base readily gives up the antibiotics to skin and tissue fluids. Absence of water from the base insures stability of the antibiotics.[4]

7. SPARING GENERAL ANTIBIOTIC SENSITIZATION

Use of rarely-sensitizing 'Aerosporin' and bacitracin for local lesions avoids possible sensitization to penicillin, streptomycin, or the broad-spectrum antibiotics, thus leaving the patient responsive to them in case of serious systemic infection.

8. PROPHYLACTIC VALUE

To protect burns, skin grafts, and other lesions from contamination by practically all bacterial pathogens, particularly *Pseudomonas*. Prevention of infection probably shortens healing time and reduces incidence of fever and inflammation.[7]

'POLYSPORIN'® Polymyxin B – Bacitracin Ointment
Available in ½ oz. and 1 oz. tubes and ⅛ oz. ophthalmic tubes

REFERENCES

1. Frank, P. F., Wilcox, C., and Finland, M.: In Vitro Sensitivity of Coliform Bacilli to Seven Antibiotics, J. Lab. & Clin. Med. *35:* 188 and 205, 1950.

2. Johnson, B. A., Anker, H., and Meleney, F. L.: A New Antibiotic Produced by a Member of the B. subtilis Group, Science *102:* 376, 1945.

3. Jawetz, E., and Marshall, M. S.: The Role of the Laboratory in Antibiotic Therapy, J. Pediat. *37:*545, 1950.

4. Wrong, N. M., et al.: The Treatment of Pyogenic Skin Infections with Bacitracin Ointment, Canad. M. A. J. *64:* 395, 1951.

5. Finnerty, E. F., Jr.: Bacitracin in Dermatology, New England J. Med. *245:* 14, 1951.

6. Jawetz, E.: Infections with Pseudomonas aeruginosa Treated with Polymyxin B, Arch. Int. Med. *89:* 90, 1952.

7. Jackson, D. M., Lowbury, E. J. L., and Topley, E.: Pseudopyocyanea in Burns, Lancet *261:* 137, 1951.

8. Meleney, V. L., and Johnson, B. A.: Bacitracin Therapy, J. A. M. A. *133:* 675, 1947.

Burroughs Wellcome & Co. (U. S. A.) Inc.

Tuckahoe 7, New York

Edrisal* relieves cramps

"The most satisfactory antispasmodic for use in spastic dysmenorrhea is, in my experience, 'Benzedrine' Sulfate . . ."

Janney, J.C.: Medical Gynecology, ed. 2, Philadelphia, W.B. Saunders Co., 1950, p. 365.

'Edrisal' relieves pain

" 'Edrisal' was more effective than any other analgesic previously used . . ."

Wells, R.L.: M. Ann. District of Columbia *20*:360, 1951.

'Edrisal' relieves depression

"Mental depression was always relieved."

Hindes, H.J.: Indust. Med. *15*:262.

Each 'Edrisal' tablet contains: Benzedrine* Sulfate (racemic amphetamine sulfate, S.K.F.), 2½ mg.; acetylsalicylic acid, 2½ gr.; and phenacetin, 2½ gr. *Recommended dose:* 2 tablets. *Prescription size:* Bottles of 50 tablets.

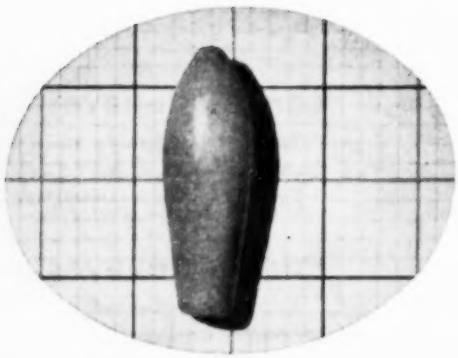
Also available, for intense pain: 'Edrisal with Codeine ¼ gr.' and 'Edrisal with Codeine ½ gr.'

Smith, Kline & French Laboratories, Philadelphia

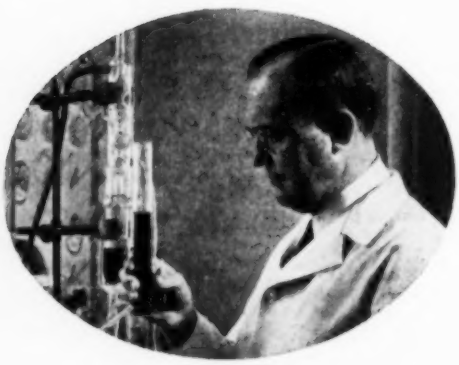
* T.M. Reg. U.S. Pat. Off.

in dysmenorrhea

DESIGNED
for easy insertion and retention



FORMULATED
for prompt relief



DEMONSTRATED
effectiveness and safety

WYANOIDS®

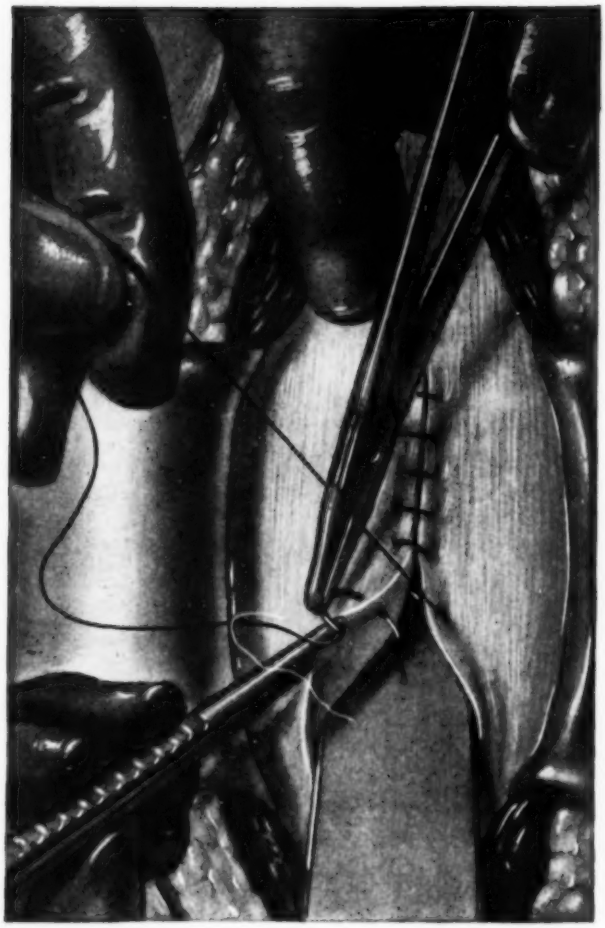
Hemorrhoidal Suppositories

Wyeth
Philadelphia 2, Pa.

Also available:

WYANOID OINTMENT

tubes of 1 ounce, with rectal applicator



Wounds sutured with smaller sizes of D & G surgical gut on Atraumatic needles have less trauma and heal faster and more evenly.

faster wound healing

Patients move about more freely after their operations and are out of the hospital sooner when their wounds have been closed with a minimum of trauma. Davis & Geck offers two modern aids to faster and more even healing:

1. **Davis & Geck "timed-absorption" surgical gut—in small sizes**
2. **Davis & Geck Atraumatic® needles**

faster healing with smaller sizes of surgical gut

Davis & Geck surgical gut sutures may be used in smaller sizes than might be expected because *diameter for diameter* the tensile strength is unexcelled by any other brand. By a unique process of control, these "timed-absorption" sutures offer maximum resistance to digestion during the early days when the wound is weakest. After healing is under way, digestion is more rapid until completed. Smaller suture sizes permit closer approximation and provoke less trauma. The patient's convalescence is smoother.

faster healing with Atraumatic® needles

In suturing with Atraumatic needles there is less tissue trauma, faster and more even healing. The D & G Atraumatic needle is joined to its suture smoothly. Needle and suture are about the same diameter. No big eye and double strand of suture are dragged through the tissue. Sutures on Atraumatic needles are economical, too. Surgery is easier and faster, needles are always sharp, *no time is lost while the nurse threads needles.*

For better wound healing, use the smaller sizes of Davis & Geck "timed-absorption" sutures, with an Atraumatic needle attached, on your next wound closure.

Davis & Geck, Inc.

A UNIT OF AMERICAN Cyanamid COMPANY

57 Willoughby Street, Brooklyn 1, N.Y.

"...a marked advance in wet dressing therapy..."[1]

1. Peck, S. M.; Traub, E. F. and Spoor, H. J.: Aqueous Solutions of Sodium Propionate with Chlorophyll as a Therapeutic Agent: A.M.A. Arch. Dermat. & Syph. 67:263, 1953.

Prophyllin®

avoids treatment dermatitis

Clinical investigators[1] welcome the superior advantages of wet dressings made with PROPHYLLIN, the new sodium propionate-chlorophyll preparation. Incorporating a constituent of the protective coating of normal skin, PROPHYLLIN makes a soothing dressing for even the most acutely inflamed skin disorders.

more physiologic: contains no chemical irritants or sensitizing agents.

nonastringent: will not block sweat ducts.

markedly antipruritic

mildly bacteriostatic and fungistatic

cosmetically acceptable: no objectionable propionate odor after powder is dissolved...does not stain.

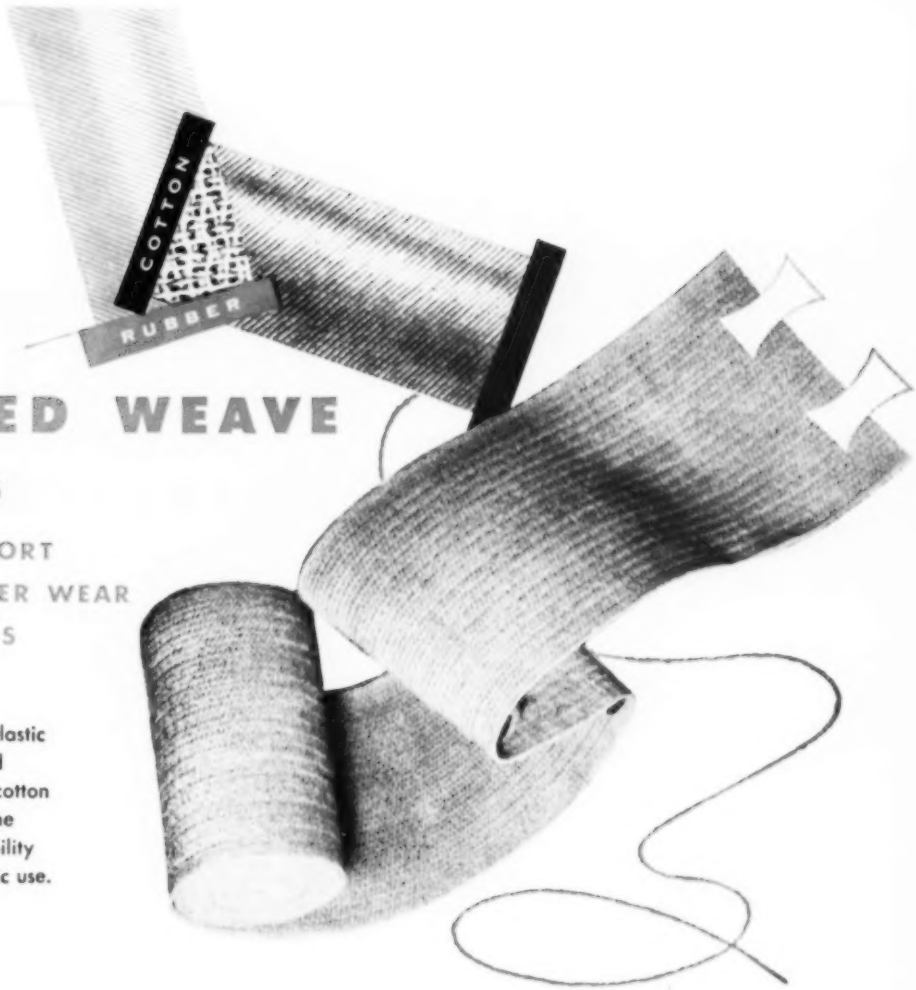
...and as healing progresses... **Prophyllin** ointment to continue the benefits of PROPHYLLIN in ambulatory patients, or when wet dressings are contraindicated or impracticable.

PROPHYLLIN POWDER, for preparation of wet dressings, in cartons of 12 packets. (Each packet contains 2.3 gm. of powder, sufficient to prepare 8 ounces of solution containing 1 per cent sodium propionate and 0.0025 per cent water-soluble chlorophyll.) Also in 4-ounce and 16-ounce jars.

PROPHYLLIN OINTMENT, in 1½-ounce and 4-ounce tubes. (PROPHYLLIN OINTMENT contains 5 per cent sodium propionate and 0.0125 per cent water-soluble chlorophyll.)

Rystan company inc.

Mount Vernon, New York



BALANCED WEAVE

MEANS

BETTER SUPPORT
LONGER WEAR
GREATER SAVINGS

The new ASEPTO Rubber-Elastic Bandage features balanced proportions of rubber and cotton in a distinctive weave for the greater strength and durability needed in hospital and clinic use.

ASEPTO®

RUBBER-ELASTIC BANDAGE

balanced weave for better support
Precisely proportioned rubber and cotton provide uniform stretch and body to give even support throughout the affected area.

balanced weave for longer wear
Stands up under repeated stretchings without loss of elasticity—can be washed over and over without impairing efficacy or appearance.

balanced weave for greater savings
Cuts costs by lasting longer. Priced to meet "economy budgets," savings increase with quantities purchased.

Supplied in plain chipboard boxes, one dozen bandages of a size to the box (6" widths in boxes of ½ dozen)

	1 doz.	6 doz.	12 doz.	10 gross
2", per dozen	$6.45	$6.13	$5.81	$5.38
2½", per dozen	7.63	7.25	6.87	6.36
3", per dozen	8.83	8.39	7.95	7.36
4", per dozen	11.13	10.57	10.02	9.28
6", per dozen	15.69	14.91	14.12	13.08

Two dozen clips included in each box.

B-D **BECTON, DICKINSON AND COMPANY** RUTHERFORD, N. J.

ASEPTO is the registered trade-mark of Becton, Dickinson and Company.

why **DESITIN**®

hemorrhoidal

SUPPOSITORIES

with **cod liver oil**

are safe, conservative therapy in **hemorrhoids**

more effective. . . . because they provide healing crude Norwegian cod liver oil (rich in vitamins A and D and unsaturated fatty acids, in proper ratio for maximum efficacy).

more comforting. . . emollient, protective, lubricant to relieve pain, itching and irritation rapidly . . . to minimize bleeding and reduce congestion.

safe, conservative. . . . . contain no styptics, narcotics or local anesthetics, so they will not mask serious rectal disease. Easy to insert and retain.

Composition of Desitin Suppositories: crude Norwegian cod liver oil, lanolin, zinc oxide, bismuth subgallate, balsam peru, cocoa butter base. Boxes of 12 foil-wrapped suppositories.

for **samples,** please write . . . . **DESITIN** CHEMICAL COMPANY ●
70 Ship Street • Providence 2, R. I.

To Minimize Emotional Trauma . . .
A Rapid and Bland Induction

VINETHENE®, administered by the simple and convenient open-drop technic, induces anesthesia swiftly and not unpleasantly. Recovery is rapid and the after-effects are minimal.

VINETHENE is a particularly suitable anesthetic:

for inducing anesthesia prior to use of ethyl ether for maintenance . . .
for short operative procedures . . .
for complementing agents such as nitrous oxide and ethylene.

Literature on request.

VINETHENE®

(Vinyl Ether for Anesthesia U. S. P. Merck)

AN INHALATION ANESTHETIC FOR SHORT OPERATIVE PROCEDURES

COUNCIL ACCEPTED

VINETHENE is a registered trade-mark of Merck & Co., Inc.

MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY
In Canada: MERCK & CO. Limited—Montreal

A New, Versatile Compound for Control of

DYSMENORRHEA

THE MENOPAUSE

ASSOCIATED TENSION STATES

SELECTIVE RELAXANT

Dimethylane relaxes spasm and tension without sedative or hypnotic effect,[1-3] by blocking interneural transmission.

BROAD SYMPTOMATIC RELIEF

Dimethylane provides relief from tension and spasm within one to four hours. The relaxant effect of a single dose lasts for three to four hours.

Dimethyl

CAPSULES 2,2-DIISOPROPYL-4-METHANOL-1, 3-DIOXOLANE

DYSMENORRHEA, MENOPAUSE

In dysmenorrhea, *Dimethylane* gives gratifying relief from cramps, backache and tension.[1-2] In the menopause, *Dimethylane* relieves hot flashes, nervousness, dizzy spells, headache, fatigue, depression and irritability.[3] Supplementary estrogen therapy may be unnecessary.[3]

EXCEPTIONAL SAFETY

Dimethylane decreases muscle tone by action on the interneurons of the central nervous system. It does *not* cause sedation or hypnosis, and actually eliminates the need for barbiturates.[3] Toxicity has not been reported. Less than 7% of patients complain of nausea and regurgitation.[1-3]

DOSAGE

Two capsules after meals and at bedtime. Dosage may be reduced for individualized maintenance therapy.

SUPPLIED

Dimethylane is supplied in translucent green enteric-coated capsules containing 0.25 Gm., on prescription only, in bottles of 100 and 1,000.

ane

THE NATIONAL DRUG COMPANY

Philadelphia 44, Pa.

More than half a century of service to the medical profession.

REFERENCES:

1. *Vivino, A.E. and Ritter, G.: M. Ann. District of Columbia, 22:117 (Mar.) 1953.*
2. *Boines, G.J. and Horoschak, S.: Delaware State M.J., 23:183, 1951.*
3. *Boines, G.J.: Med. Times, 81:50, 1953.*

Clinical Evaluation of Phenergan® in Hay Fever

In the management of hay fever, physicians know that it is not always possible or practical to carry out desensitization therapy. Until definitive measures can be instituted, the administration of an appropriate antihistaminic agent offers the most effective method for alleviating allergic symptoms.

Most efficacious . . . longest-acting antihistamine[5]

Since long-term therapy is involved in the management of hay fever, numerous investigators have studied Phenergan because of its marked duration of action and high potency.[1-5] Waldbott and Young[2] were among the first in the United States to report the successful use of Phenergan in hay fever and allergic rhinitis. In a recent study of 102 patients with hay fever, Silbert[3] stated: ". . . results obtained with Phenergan in symptomatic relief of pollen hay fever were far superior to those obtained with any other antihistaminic agent." The mild sedation produced by Phenergan was distinctly beneficial in many patients.

Individualized dosage for therapy without side effects

Silbert's findings suggest that before deciding that symptoms cannot be controlled without producing side effects, the physician should try various doses of Phenergan to determine the *individualized* dosage that controls symptoms without causing drowsiness.

Sensitization tests not affected

A significant observation of Peshkin[5] is that therapeutic doses of Phenergan (1 or 2 tablets daily) do not inhibit or even diminish the size of the cutaneous diagnostic sensitization reactions commonly observed in allergy practice. On the basis of his studies with children as well as adults, Peshkin concludes that Phenergan is ". . . a valuable and safe drug to administer to allergic patients of all ages."[5]

Phenergan is supplied as Tablets containing 12.5 mg. Phenergan; and as a peach-flavored Syrup containing 6.25 mg. Phenergan in each teaspoonful (5 cc).

Wyeth

PHILADELPHIA 2, PA.

BIBLIOGRAPHY

1. *Bain, W.A., and others: Lancet 2:47 (July 9) 1949*
2. *Waldbott, G.L., and Young, M.I.: J. Allergy 19:313 (Sept.) 1948*
3. *Silbert, N.E.: Ann. Allergy 10:328-334 (May-June) 1952*
4. *Halpern, B.N.: J. Allergy 18:263 (July) 1947*
5. *Peshkin, M.M., and others: Ann. Allergy 9:727 (Nov.-Dec.) 1951*

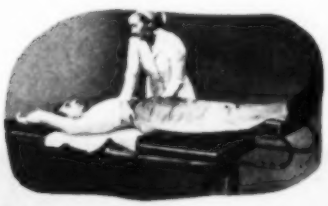
*new **PROVIDES MECHANICAL MASSAGE WITH HEAT**—automatically controlled, electrically timed—completely adjustable to tolerance of the individual patient—Short duration of treatment keeps workers on the job during the period of therapy, eliminating waiting and other delays . . .

There is Nothing Like . . .

SACRO-MATIC*

NEW

IN THE TREATMENT OF TRAUMATIC OR INDUSTRIAL BACK . . .



*new **THERAPY IS PLEASANT—IMPERSONAL**—helping to relieve psychic stress—creating a sense of WELL BEING so often needed in relieving underlying causes of pain—completely eliminates personality conflicts.

*new **NO EXPENSIVE INVESTMENT NEEDED** as SACROMATIC may be rented at an extremely moderate cost —*created specifically for industrial medicine*—the SACROMATIC table is easy to use—dependable—trouble free—handsomely designed and engineered at Ohio State University. You will be proud to have SACROMATIC in your department.

In any therapy involving massage and heat— SACROMATIC will do it better—quicker—and at considerably less cost than any method you may now be using! Completely eliminating the need for hard-to-find physiotherapists.

NEW
in the treatment of traumatic back

SACRO-MATIC, Inc.
Plaza Building, Port Washington, Long Island, N.Y.

Natural bile acids *help restore* natural biliary function

- 'Bilron' contains natural conjugated bile acids combined with iron.
- 'Bilron'—a potent, true choleretic—produces bile of natural composition and consistency.
- 'Bilron' is chemically enteric. It is soluble in the alkalinity of the intestine, where bile is normally released.

Eli Lilly and Company
Indianapolis 6, Indiana, U.S.A.

Lilly

'Bilron' is indicated in gall-bladder-type indigestion, constipation, biliary dyskinesia, and following cholecystectomy.

PULVULES

'Bilron'

(IRON BILE SALTS, LILLY)

INDUSTRIAL MEDICINE AND SURGERY
SEPTEMBER, 1953

The Consumer of Industrial Health Services

An Address by
REAR ADMIRAL H. E. HAVEN, USN
Commander, Puget Sound Naval Shipyard, Bremerton, Washington

As a Shipyard Commander and representative of the Bureau of Ships, I should like to address my observations from the point of view of a customer for industrial health services. The Bureau of Ships employs a greater number of industrial workers than any other naval activity. From a long and varied career in shipyards, including several years as commander of different yards, I have had the opportunity of observing the growth of medical services in shipyards from on-the-job first-aid treatment to the present broad concept of health conservation, and I like what I have seen.

Shipyards are an industrial activity set up to furnish logistic support to the fleet. This is effected by gathering within the establishment the tools of production—material, machines and men. Industry soon learned that the maintenance of machines in highly efficient operating order was essential to good production. The knowledge that the maintenance of men in the same order was probably more essential was a little slower in coming. The effectiveness of the machine is proportional to the effectiveness of the operator. Good workmen with poor tools produce better results than poor workmen with the finest tools. It is now apparent that man's productivity is strictly related to his mental and physical well-being, and this state is not only influenced by the presence or absence of disease but also by many other factors such as nutrition, mental hygiene, housing, sanitation, recreation, noise, vibration, lighting, ventilation, atmospheric pressure, climatic changes, and as our industrial operations increase in technical complexities we introduce a myriad of other influences.

As we earlier learned that maintenance of machines and equipment in a high state of efficiency is essential to good production and developed methods and trained personnel in this field, we now look to the Medical Department to operate the maintenance program in the field of manpower. What does management expect of its Medical Department? What does it hope to gain? I believe that an industrial health program should offer a comprehensive approach to the total occupational health needs of the employee population. A well-administered and complete program should result in benefits both tangible and intangible, i.e., dividends should accrue in cold, hard dollars and cents as well as in improved morale.

Specifically, some of the expected results are savings in unnecessary expense to management and employee, increased production quality and quantity, reduced production costs, decreased labor turnover, lowered accident rates, reduced sickness absenteeism, improved worker morale and job satisfaction, improved employee and interactivity relationship, and better community relationships. In Shipyard operations where the manpower cost is over 80% (82-83%) of the budget, the maintenance of a highly productive, efficient work force is essential. At this time when our armed forces are engaged in a war against communism and the nation is mobilizing its entire strength for a long period of armed defense against a conflict that may or may not be forced upon us (a conflict in which our potential enemies control 32% of the world's population and we but 6%) it becomes even more important that we increase our efforts in the conservation and better utilization of this, our most vital resource. Further incentives to this program are the recent directives and trends to lower manpower ceilings without reduction in efficiency of operations. The best substitute for manpower is a high degree of efficiency.

I believe that in the past 12 years the occupational health program has achieved a position of worth in the Navy's shipyards and can take pride in its accomplishment of benefits, to both employees and management. These accomplishments have been especially marked in the field of environmental industrial hygiene control and in the reduction or almost disappearance of occupational disease such as silicosis, lead poisoning, conditions due to fume and gas exposures, etc. In the field of safety, the record of which BuShips takes

An Address presented at the U.S. Navy Industrial Health Section of at the Los Angeles Industrial Health Conference, April 20, 1953.

justifiable pride, the Medical Department has made valuable contributions, not only in the improved treatment of injuries but also in the obtaining of information, and in recommendations to safety personnel for use in their prevention program. The periodic physical examinations, chest surveys, etc., have been of value in maintaining the individual's health and well-being. Not all fields of occupational health have been as completely explored as those mentioned. Some of these fields, I believe, if thoroughly studied would result in great advantage to the individual worker. First is the field of absences for non-occupational illnesses, especially those of short duration. We know that some individuals have a much greater absence frequency than others, and in some cases we know why, but as yet we have no practical program for improving this condition. Concomitant with this is the frequent dispensary visitor. We know that a small percentage of the employee population receives a large percentage of medical attention. This should provide a fertile field of study. Then we have the accident-prone individual, and the individual with a good safety record who begins to have frequent accidents. Is there anything we can do about these? In reviewing accident reports and in investigations of accidents we find numerous such cases, in which all possible safeguards were established and still the individual had an accident. Probably a more careful study of the individual will give us the information to prevent future occurrences. Shipyards, as private industry, are losing production and money because of alcoholics, and certainly the individual and his family are losing much more. Are we doing all we can to cure and retain these people in productive effort? I believe a program of study of this problem would produce great benefits.

I also believe that further study by the Medical Department on the physical demands of job classifications in cooperation with the production department would result in better utilization and better placement of physically handicapped individuals. These channels, if further studied, would result in increased benefit to the employee and to management.

IN THE foregoing I have stated what the Shipyard Commander would like in the way of an occupational health program. I should now like to make a few remarks from personal observation of medical programs.

The present laws, rules and directives, I believe, allow for the setting up of a complete occupational health program and are applicable to all establishments. It does not follow that all programs are equally good. Personal observation has shown that there is great disparity in the effectiveness of the program in different establishments. There are a number of reasons for this. Chiefly, they are influenced by the philosophy of management, budgetary allowance, and the imagination, training, interest and knowledge of the medical officer—and I repeat—the imagination, training, interest and knowledge of the medical officer. Obviously, the medical officer is the most important of these. He must first of all have an interest in this type of work and not only should he have training in the arts and mechanics of his profession and specific professional knowledge of occupational health, but also he should have a thorough knowledge of all the laws, rules and directives pertaining to his work, as promulgated by the various departments of the Navy, Civil Service Commission and U.S. Bureau of Employees Compensation. This should include a comprehensive knowledge of the industrial processes of the establishment and a knowledge of industrial management, industrial and personnel relations, policies and problems, so that he can coordinate the functions of the Medical Department into a harmonious and integral part of the shipyard organization, with a program that is materially acceptable to management, to supervision, and to the individual employee. I believe those responsible should take prompt, appropriate action.

In-Plant Knowledge

I HAVE in mind a large plant of 15,000 employees, which was favored with the part-time services of about 30 doctors and had two hospitals available. Yet the record showed their morbidity was about twice as high as the national average, in spite of the fact that their medical opportunities were far greater than the average plant community. There was one important thing wrong here: None of these doctors had in-plant knowledge. When this was introduced, it was found that 500 of these workers, or 3%, were responsible for 40% of the morbidity. Upon studying these 500 cases it was found that about 280 had problems which would respond to preventive types of medical treatment. When this approach was tried, the excessive morbidity was brought into line.

—From "Industry's Challenge to the Medical Profession," by W. H. SEYMOUR, Vice-President, Liberty Mutual Insurance Company, in the Proceedings of a Symposium on Industrial Medicine, Harvard School of Public Health, April 3-4, 1953.

Organic Phosphate Insecticides

HARRY H. UTES, M.P.H.
Wasco-Sherman Public Health Department
The Dalles, Oregon

PUBLIC health problems associated with the use of organic phosphate insecticides are close to many communities in the agricultural west and south. Although the public as a whole has a stake in insecticide residues on food, occupational health factors are the immediate concern of the communities in which they occur. The purpose of the original paper,* therefore, was to attempt to explore the extent and importance of the residue problem to man and animals as well as to gather data relating occupational exposures to the cholinesterase test. A summary of that portion of the paper follows.

The organic phosphates referred to in this article include tetraethyl pyrophosphate (TEPP), parathion (0-0 diethyl 0-p-nitrophenyl thiophosphate), EPN (ethyl p-nitrophenyl thionobenzenephosphonate, and malathon (0-0-dimethyl dithiophosphate of diethyl mercaptosuccinate). Studies conducted in various part of the country on a variety of agricultural products indicate generally that the disappearance of parathion from plants appeared to be related to temperature, and that little or no insecticide remained as long as a month. It was also found that the translocation of insecticide from leaves to the edible portions of the food amounted to less than the estimated safe tolerance of 0.20 ppm. When TEPP was used, decomposition occurred in a few hours to non-toxic products, thus posing no residue problem and permitting it to be used well up to harvest time.

Residues on citrus peel, however, which absorbs the poison may be highly important because it may be used for food. Parathion concentration in the peel may go as high as 2-3 ppm calculated on a peel basis which is the equivalent of about 0.16 ppm on the whole fruit. No insecticide was found in the pulp of the fruit. When the emulsified form of parathion was used, the penetration was greatest although much was lost 10 to 20 days after application. When parathion was applied as a wettable powder, it was not found in the pulp of apples, peaches, or pears. Apples and pears do not respond well to washing to remove parathion, however, perhaps because the residues are actually subsurface.

While reports on the toxicological effects of parathion on animals are not extensive, several observations of interest are noted in the literature. When a heifer and a yearling bull were allowed to graze on successive pastures with feed containing 1.4 to 9.5 ppm parathion, green weight, there was no external evidence of injury observable. A postmortem performed on both animals, however, showed a marked hypertrophy of the liver in each instance which may have been caused by the ingestion of the parathion. The results of another experiment performed on dairy cows which were fed parathion at the rate of 0.02 to 0.11 mg. per kg. body weight by capsule for 81 days indicated that the milk was free of parathion and no objectionable flavor was noted, and no unfavorable symptoms were observed in the animals.

When rats were fed parathion at the rate of 50 ppm, some deaths occurred. No deaths occurred when they were fed 10 to 20 ppm, but the second generation rats produced many dead in their litters.

Malathon is a newcomer in the insecticide field. Although a cholinesterase inhibitor, no depression from the normals was noted in a limited study on workers in Washington State in 1952. No effects were noted in rats when fed 5000 ppm for 63 consecutive days. The LD_{50} dose for rats is 750 mg. per kg. body weight as compared with 30 and 3 mg. per kg. body weight in male and female rats when using parathion.

The rate of decomposition of parathion in the body, and the modes of absorption are of importance to all who may be concerned with the material. An experiment is reported in the literature in which parathion tagged with radioactive S^{35} was fed to rabbits. Very little parathion or sulfur-bearing portion remained in the blood, organs, or tissues for long. The compound and degradation products were rapidly excreted in the urine. One is cautioned, however, in the matter of drawing parallels with human subjects.

Officials in Florida state that there were 25 authenticated cases of parathion poisoning in 1950, and that skin absorption was the primary cause of the illness. The authors state that in their opinions operators of spraying and dusting equipment should not be exposed to parathion for more than a week or two at a time, and that a week should elapse between intervals. The matter of exposure may also be related to the means of application of the insecticide. In an extensive study of the methods of application in Washington State in the summer of 1951, it was found that the average concentration of parathion in orchards when applied by helicopter dusting and fogging was substantially greater than follow-

*Condensation and summary of a thesis study on the subject of health hazards associated with the use of organic phosphate insecticides.

ing hand spraying although biplane dusting resulted in the lowest concentration of all. On the other hand, wind drift from biplane dusting was much greater than that following fogging or hand spraying operations. Such factors may be of importance to those who work in orchards or live adjacent to the area of operation. For example, four hours after helicopter dusting, the concentration of parathion had dropped from 3.4 to 0.15 mg. per cubic meter of air, and one hour after spraying with speed equipment, the drop was from 0.29 to 0.02 mg. per cubic meter of air.

The characteristics of poisoning by inhalation are reported in a chemist in Italy. This person developed symptoms in 30 minutes while working in a vat where there were about 10 grams of parathion. A reduction of about 45% cholinesterase (not reported whether plasma or cell) developed. Thirty percent drop in red cell cholinesterase is stated to be necessary before symptoms suddenly manifest themselves. After treatment with oxygen and atropine the symptoms disappeared in from four to five hours, and in 48 hours the cholinesterase was normal. The lack of a latent period was attributed to absorption by inhalation. In other workers the cholinesterase dropped 5-15% at the end of the work day, and returned to normal the following morning.

In the spring and summer of 1951, the author participated in a study of a limited number of cases of parathion exposure in Oregon. Case No. 1 listed in this record was an accidental poisoning by inhalation. This case came to the attention of the health department only through other professional contacts. As will be noted in the summary, his first red cell cholinesterase four days after exposure was 1.13 (method of Brown and Bush). However, when the patient apparently had fully recovered one and a half months later, the result had dropped to 0.36 although his condition at that time appeared favorable to his physician.

Cases Nos. 2 and 3 were speed spray and nurse tank operators, respectively, at the same large orchard operation. It will be noted that there is a definite relationship, though not complete, in the red cell cholinesterase levels of the two workmen. No classical symptoms of poisoning developed in either of these individuals during their participation in the study although both indicated that a loss of appetite and general restlessness occurred as the season progressed. No extra exposure is recorded to account for their final very low cholinesterase levels.

Case No. 4, the pilot, had two low red cell cholinesterase tests. One taken on June 13 undoubtedly reflected his longest parathion exposure of the season, two hours spraying with 2% parathion. Again, as with the two previous cases, there was a marked drop at the season's close with no significant symptoms, and no known reason for the drop. A complete work record is given for the pilot in Table II.

It was the opinion of the public health staff engaged in this study that the laboratory results were influenced by factors of time and temperature which prevailed between the time the blood sample was taken and receipt by the laboratory, a matter of not over 24 hours generally with a prevailing temperature around 80 F. Studies have been reported, however, using the whole blood method indicating that red cell cholinesterase is very stable between 7 C and 32 C, the variation from the control being a plus 1.5% for the unrefrigerated and 5.0% for the refrigerated samples during the test period of one week. Hemolysis did not materially affect the results of the tests. Moreover, it has been

TABLE I.

	Contact Date	Cholinesterase Cells	Cholinesterase Plasma
Case No. 1: No control sample. Patient reported illness almost as soon as 2-hr. contact dusting operating began. It is presumed that exposure was made at the time of preparing material (parathion) for dusting. No protective clothing used. Army type (dust?) respirator used. Symptoms — headache, nausea, visual problems, muscular incoordination. Nurse contacted patient accidentally by call at house May 24. Atropine administered on advice of H.O. Patient improved next day. Complete recovery.	5/28/51	1.13	4.11
	6/4/51	2.32	6.08
	6/27/51	2.81	7.65
	7/12/51	0.36	8.90
Case No. 2: Orchard manager. E.P.N. — DDT-TEPP used. Protective clothing but no respirator. After initial control sample was taken, operator was exposed to 70 hrs. high speed spray operation. Patient has been listless and without good appetite following spray session. Second session which began after 6.21 blood test was for two days only.	5/25/51	2.96	6.34
	6/1/51	2.04	4.38
	6/7/51	2.10	4.97
	6/15/51	2.50	5.85
	6/21/51	2.24	9.10
	6/29/51	3.26	6.50
	7/5/51	3.77	7.10
	7/12/51	1.69	6.75
	8/2/51	1.41	3.12
Case No. 3: Mechanic, nurse tank operator. Assistant to orchard manager. Similar contacts and clothing as orchard manager. No personal interview.	5/25/51	2.96	4.03
	6/1/51	2.02	2.62
	6/7/51	2.40	3.44
	6/15/51	1.47	3.32
	6/21/51	3.44	6.68
	6/29/51	2.68	3.88
	7/5/51	2.42	3.88
	7/12/51	1.69	3.32
	8/2/51	lost	1.83
Case No. 4: Airplane spray pilot. Variable contact with organic phosphates (dusting). No appreciable headaches, but definite visual problems.	6/1/51	2.10	7.63
	6/7/51	2.44	7.96
	6/15/51	2.10	4.41
	6/16/51	2.60	5.25
	6/22/51	3.30	6.81
	7/7/51	2.42	10.45
	7/13/51	0.70	10.00
	7/20/51	2.54	6.80
	7/21/51	2.68	8.60
	7/28/51	2.71	4.39
	8/6/51	0.96	0.99
	8/10/51	0.47	2.40

TABLE II.
DAILY WORK RECORD OF SPRAY PILOT

Date	Plasma Activity	Cell Activity	Spray Material	Contact Time (min.)	Protection
June 1	7.63	2.10			
June 2			2% Para.	:15	M.S.A. Resp.
June 7	7.96	2.44			
June 8			2% Para.	:15	M.S.A. Resp.
June 15	4.41	2.10			
June 16			1% TEPP.	:15	No. Resp.
June 16	5.25	2.60			
June 22	6.81	3.30			
July 2			2% Para.	:15	M.S.A. Resp.
July 7	10.45	2.42			
July 7			2% Para.	:60	M.S.A. Resp.
July 7			3% Para.	:15	M.S.A. Resp.
July 9			2% Para.	:15	M.S.A. Resp.
July 11			2% Para.	:120	Full-Face Gas Mask
July 13	10.00	0.70			
July 20			2% Para.	:30	M.S.A. Resp.
July 20			3% Para.	:90	M.S.A. Resp.
July 20	6.80	2.54			
July 21			3% Para.	:45	M.S.A. Resp.
July 21	8.60	2.68			
July 22			1% TEPP.	:45	No. Resp.
July 26			2% Para.	:15	M.S.A. Resp.
July 26			3% Para.	:75	M.S.A. Resp.
July 28	4.39	2.71			
Aug. 2			3% Para.	:60	M.S.A. Resp.
Aug. 2			2% Para.	:30	M.S.A. Resp.
Aug. 2			1% TEPP.	:90	No. Resp.
Aug. 6	0.99	0.96			
Aug. 10	2.40	0.47			

M.S.A.—Mine Safety Appliance Cartridge Type Respirator.

reported that, statistically, the normal curve for plasma was found to be from 0.442 to 1.377, and for red cells it was 0.527 to 1.207 and a mean deviation for each of 0.144 and 0.122 respectively in a study of 255 subjects.

Research on the use of urinary paranitrophenol tests as a measure of exposure does not show consistent correlation with the blood cholinesterase tests or with symptoms. The cholinesterase may actually be normal when the paranitrophenol excretion is high. On the other hand, paranitrophenol excretion varies considerably from day to day, and up to 40 gammas per 100 ml. of sample may be present without the appearance of symptoms.

Microtesting for cholinesterase is the method of choice in examining for parathion exposure, and the whole blood method, particularly, is well adapted to laboratory analysis as well as to field collection.

We are authoritatively advised, however, that while plasma and red cell cholinesterase measurements are of value in confirming acute exposure, they offer little help in evaluating the degree of exposure or severity of symptoms. The data presented in this paper would appear to support the foregoing statement.

(510 Court Street)

Not a Compensation Case

THE last example I shall give is that of a man who claimed lead intoxication. His job was in the electrical division and occasionally he was engaged in heating babbitt and pouring small bearings. This work was done in a proper enclosure with adequate ventilation, and it had been established by repeated tests done by our Occupational Hygiene Engineers that there were insufficient lead fumes in the atmosphere to affect anyone, even though he worked constantly at the babbitt pots. The diagnosis of lead intoxication had been made by the family physician on the basis of a lead line on the gums, a mild anemia, loss of weight, and questionable blood smears. It happens that in our medical program we have a rather close follow-up on medical conditions which are being treated by outside physicians. We knew this particular man had been under treatment for lues for several months. We were of the opinion that this was not a compensation case because of the absence of reasonable exposure, but we took the precaution of having the man examined by a consultant, who advised us that the man was suffering from bismuth intoxication. The family physician who had been giving the man his bismuth shots was very much surprised when his case of lead intoxication turned out to be over-treatment with bismuth.

—From "What Constitutes a Compensation Case," by E. H. CARLETON, M.D., in *J. Iowa State Med. Soc.*, August, 1953.

Hand Injuries

THE IMMEDIATE TREATMENT OF ACUTE OPEN WOUNDS

MICHAEL L. MASON, M.D., F.A.C.S., Chicago

THE SURGICAL care of wounds of the hand demands a great deal of the surgeon who undertakes it. It is almost a branch of surgery in itself, in that it requires the combined skills of the surgeon accustomed to managing wounds and acquaintance with and ability in the techniques of the neurosurgeon, the orthopedic surgeon and the plastic surgeon. It requires certain specific training in these fields since the care of a patient cannot be relegated in turn to each specialist; for any single operation may demand all of their specialized knowledge. While it is perfectly true that many of the more trivial injuries may call for no great technical skill, difficulty will arise in the evaluation of a wound which may appear trivial but conceal deep injury. When it comes to the more serious wounds with extensive loss of skin, open fractures, traumatic amputation and severe crushing injuries demanding wide excision, the judgment of even the most experienced is severely taxed. Pulvertaft has said that, "the hand does not readily forgive errors in treatment," a truth which I am sure is exemplified every day on any service where hand cases are cared for. This sentiment is again well expressed by Evans who wrote that, "the price paid for inefficient surgery is very great."

One does not like to belabor the point unduly and emphasize the importance of one's own special interest in surgery. Nevertheless the great frequency of injuries to the hand makes this a very large field of the surgery of trauma. Today with extensive mechanization, extending from the factory to the farm, trauma is probably the most frequent single cause of "disease." It lacks possibly the emotional appeal of certain other medical and surgical conditions but as far as disability and economic loss are concerned trauma, and particularly trauma to the hand, is by far more significant. In industry fully 50% of injuries involve the hand, and although figures for non-industrial injuries are not available the hand must stand quite high in the list. But injuries of the hand are not important just because of their frequency. Their importance lies above all in the potential economic and functional loss which may follow. Few injuries of the hand, even the trivial, lead to less than eight to 10 days disability, many lead to much longer periods and, when one considers the not too infrequent case whose rehabilitation may require months or even one or two years with eventual often extensive permanent partial disability, the extent of the problem becomes evident.

Surgery of the hand is by all odds not for the surgeon in a hurry. The actual carrying out of the technical details of an operation may require several hours and often a fair amount of consideration and deliberation. Also required is time spent in dressings and after care, always best done or directly supervised by the surgeon himself, who alone is well enough conversant with all details of the injury. One operative case may block an operating room for a whole morning or an afternoon, and a long operative schedule can seldom be attempted by anyone doing hand surgery. A surgeon who wishes to do hand surgery must expect to be required to stop all other activities and care for a wound when it comes in, since early care is a *sine qua non* for success. Haste in these operations leads to imperfect hemostasis, tearing and fraying of nerve and tendon wounds, rough retraction and ill-considered spot judgments, any one of which may lead to failure.

The initial care of a wound of the hand is by far the most important step in its treatment. Excellent skilled subsequent surgery and rehabilitation may greatly improve the use of a hand but can often not compensate for initial errors in care. This holds true for trivial injuries as well as severe ones. In case of the trivial wound it is often the neglect of adequate treatment, failure to take the wound seriously, that gets us into trouble. We seldom today see the acute spreading infections of the hand which were at one time the bugbear of the surgeon. These in most instances followed neglected minor injuries which were either not taken care of or were treated inadequately. Minor wounds are taken more seriously today than they were 20 years ago and few people escape the penicillin needle. But if we see a lymphangitis today it is usually a sequel to a trivial but neglected injury. In case of the extensive wound the difficulties usually arise from errors in initial care, most important of which are (1) extensive primary repair in a wound under conditions unsuitable for such care; (2) retention of nonviable skin flaps which slough in a few days with resultant serious disturbance in healing; (3) failure to close the wound at all; (4) failure properly to splint the hand.

The initial care may, in the majority of instances, be final and definitive even in quite extensive wounds, and on the other hand it may be simply the first stage of repair even in seemingly simple wounds. The extent of primary care will

depend upon the condition of the wound and the patient, and the skill and equipment of the surgeon. It is just as important for the surgeon to know what to do as not to do. Extensive primary surgery may completely wreck a hand even for the most skilled reconstruction later, whereas good results may be secured from reconstruction in a hand which has healed by primary intention and in the position of function. The surgeon should not be criticized for omitting deep repair in a wound, providing he recognizes the extent of injury, if he feels that such repair cannot be accomplished safely under the circumstances.

In all stages of treatment primary healing is essential. Healing must not only be firm but it should also be with the minimum of reaction, since gliding and motion are essential to functional restoration. Primary healing depends upon rest, well vascularized healthy tissues, and the absence of infection.

There must be the minimum of sacrifice of tissues on the hand. Excessive sacrifice of tissue is serious any place, as was learned in the early days of World War II, when the surgeon early in the game and without experience in wound surgery usually excised large borders of skin from wounds. Unfortunately this zeal did not always extend to the deeper layers and hopeless tissue was too often left in the depths. However, the excessive skin excision frequently made secondary closures exceedingly difficult. The hand, however, has little tissue to spare, and needless sacrifice may make eventual functional restoration difficult or even impossible.

The greatest enemy to successful surgery of the hand is scar tissue. The hand is a mobile organ, its parts are small and closely fitted and adapted to each other. The joints are small despite their wide range of motion, and a very minimum of scar tissue may lead to immobilization. The tendons on fingers and wrist are covered with fine glistening membranes that enable them to move through narrow and rigid channels. Even a slight increase in size of a tendon may block it in its channel, as witness the disturbance of snapping tendons. The tendons as they pass across the wrist and over the volar surfaces of the fingers are in close apposition to each other and to the walls of the rigid channel within which they lie. Any roughened spot or healing process in the tendon or its fibrous sheath tends to bind the two together and if these adhesions are extensive or if the local reaction is great this will usually completely immobilize the tendon. Wounds which heal by secondary intention heal necessarily by the piling up of granulation tissue and this is the forerunner of scar. It is only when the surgeon, who wishes to do surgery of the hand, becomes as conscious of those things which cause scar as he is of the tenets of asepsis and observes the one as religiously as he observes the other that he can feel he has mastered the initial rudiments of technique. Scar is of course unavoidable, else we would have no healing, but with proper technique and care it can be minimized. Scar results from the action of the tissue to injury whether the original wound, about which the surgeon had no control, or surgical trauma over which he has very great control. It may result from edema or from the absorption of hemorrhage. Irritants such as bacteria lead to tissue reaction which ends up as scar, while a similar, often as severe disturbance may follow the use of antiseptics introduced to combat bacteria. Foreign bodies are irritants, witness the persistent sinuses that follow implantation of wood splinters and equally or even worse troubles when dead bone lies deep within a wound. Dead tissue is a foreign body just as are ligature and sutures. No one yet has succeeded in repairing wounds without sutures and ligature, but the finer and less irritant they are the less likely we are to have difficulties. Dead tissue may follow not only the effects of the traumatizing agent but also the traumatizing forceps and retractors, and the ligatures of the surgeon.

It is to minimize delay and disturbance in healing, to protect against secondary contaminants and to secure prompt and reactionless healling that all wounds of the hand should be closed primarily. Certainly the longer the wound stays open the more will granulation pile up, the more likelihood of secondary infection and the greater the amount of scar which will result. There are obviously some situations in which primary closure will not be possible or feasible, but they are rare in civilian practice.

It is obvious from the foregoing that correct operative technique is as important in surgery of the hand as is rigid asepsis. The surgeon must know not only proper methods of repairing structures, of suturing nerves and tendons, of reducing fractures, of grafting skin and applying pedicles; but he must also know how to handle tissues gently, he must secure adequate visualization without rough retraction, he must secure and maintain a dry operative field. He must accustom himself to the use of small instruments, needles, and sutures. And he must be willing to take the time to be careful.

THE PRIMARY goal of all surgery for trauma to the hand is functional restoration; the hand is an organ which does things, a motor and sensory end organ, as it were. It has a certain beauty and character, it can be extremely expressive, but its beauty lies in its adaptability to function and its expression of character lies in the effects of honest toil on the member which caried it out. Our aim in surgery is to restore to the hand the ability to carry on that honest toil and all the other acts of daily life for which the hand is essential. Cosmetic restoration is of secondary consideration. To restore use to the hand the surgeon must know what the hand does and how it does it. He must know not only its anatomy but also its physiology. Of the multitude of functions of the hand there are three

basic ones, which form the groundwork on which the surgeon builds. There are the two basic motor functions of grasping and pinching; with these two functions restored even in quite rudimentary form the individual has a useful hand. Obviously for a violinist or a surgeon, or a jeweler or a skilled tool maker, these two basic functions in crude form will not be enough to enable him to carry out his profession, and one must attempt to restore the hand to its greatest usefulness compatible with the tissue one has to work with. But in the severely mangled hand, in the paralytic hand, in the severely burned hand so little seems left that restoration appears impossible. Here an application of basic function gives us some guide to follow, some basic goal when everything seems hopeless. The other function which we should restore if at all possible is that of sensation. When feasible, of course, full sensation is striven for, but this is not always possible, and does not always follow even after apparently correct nerve repair. But a hand without sensation, while useful so long as the patient can see his hand and guide it, is often useless and occasionally a menace.

The general principles of the actual immediate care of open wounds of the hand have been so often outlined that I hesitate to do so again. They are, in brief, to cleanse the wound, to excise hopelessly devitalized tissue, to remove foreign bodies and debris; to reconstitute the hand insofar as the injury, the conditions at the time and the tissues permit, and as the ability and equipment of the surgeon justify; to close the wound with skin by whatever technique is necessary, and to apply a compression dressing with the hand or its involved parts on a splint in the position of function.

We may dilate somewhat on the various steps in this case and emphasize certain features which have seemed to us of importance.

During all stages of care, for as long as the wound remains open it must be protected from the introduction of further contaminants. The significance of secondary infection has been amply demonstrated, particularly in the case of burns, which are in effect large open wounds. Even in the open care of burns (of which I am not an advocate) protection from contaminants is secured by a coagulated crust which, when dry and unbroken, forms a protection to vulnerable tissues below. However, even here care must be taken to keep this protective crust intact, and, as soon as it is removed for eventual grafting of third degree burns, a protective dressing is required. In the open traumatic wound coverage must be provided from the start. As first aid, the wound, contaminants and all, is covered with a voluminous pressure dressing which is left in place until the patient reaches the spot where definite care is to be given. In all subsequent stages of care, examination of the wound, the operation (of course), and subsequent dressings are accomplished under conditions which prevent or greatly minimize the introduction of secondary contaminants. Masking and no-touch technique of dressings during all stages are good habits to be learned early in one's surgical training.

Control of bleeding as a first aid measure is practically always accomplished by a pressure, or better said, a compression dressing. The various emergency tourniquet techniques so assiduously taught in first aid courses have little application in the care of the hand injury. Here a compression dressing snugly applied will practically always stop hemorrhage. In the rare case a tourniquet will be needed, but if so the patient must be kept under strict surveillance until it is removed lest it create more damage than the loss of a moderate amount of blood. It has been our experience, and that of others I am sure, to see a patient admitted to the emergency room with a bleeding wound of the hand and a tight tourniquet applied to the arm or forearm. As soon as this crushing tourniquet has been removed the bleeding, usually venous in origin, promptly ceases.

Just as the surgeon protects the wound from secondary contaminants, so must he also protect it from secondary trauma. We are all familiar with the closed femoral fracture which is converted into an open fracture when it is not properly splinted on the spot. We have each seen or at least heard of the simple spinal fracture converted into a cord division by improper handling of a patient with an injured back by zealous bystanders. These are, of course flagrant examples with especially alarming sequelae, but they illustrate the need for the protection of the injured part from the effects of further trauma. The injured hand should be immediately splinted, preferably in the position of function, under a large pressure dressing. Following surgical care, splinting adequate to the condition should be maintained until healing has taken place.

One principle of the care of open injuries of the hand which we find is often disregarded is that of early surgery. The trivial wound, which parenthetically may not always be trivial, is usually accorded early treatment because it can be taken care of quickly even by a busy surgeon. The severe injuries, however, are frequently put off, for several hours, often over night, because it is realized that their treatment is exceedingly time consuming and difficult. A serious hand case, one with division of nerves and tendons, with open fractures, loss of skin and severe crushing, coming to the surgeon in the midst of an otherwise busy schedule poses a real problem. If it comes in at night there is the temptation to give the man a sedative, antitoxin and a large dose of penicillin, and put the operation off until a more convenient time next day. Obviously, delay may be indicated by the presence of shock or of other injuries requiring priority care, but in the main there is seldom any such reason for delay. Time, so far as hand injuries are concerned, is meas-

ured in hours, not days, and a few hours may make the difference between primary as opposed to secondary nerve and tendon repair, between primary as opposed to secondary closure, between reactionless healing per primum as opposed to secondary healing with wound discharge and infection.

The history of the wound is important for more than just reasons of securing a proper record of the case, and is not just perfunctory. There are two bits of information that are important so far as the wound is concerned and which will help the surgeon in decisions as to care. One of these is the probable degree and extent of wound contamination, the other is the degree and extent of tissue damage. As regards the contamination of the wound, inquiry should attempt to determine what were possibilities of serious initial contamination, i.e., at the time of wounding, and what secondary contaminants are likely to have been introduced later. As far as tissue injury is concerned the surgeon wishes to know how severely damaged the tissues were by the initial injury and what injury or other damage the tissues have been subjected to since the original injury. These two lines of questioning should direct the preliminary examination.

Specifically it is important to know when the injury was sustained. Time is still an important factor in determining the extent of initial surgery. While many other factors are important and time in itself is not to be blindly followed, there are certainly limits on initial surgery imposed by time. The older the wound the more likelihood contaminating organisms have of becoming invasive and the greater the possibility of wound disturbance developing. The amount of initial reparative surgery likewise is curtailed as the time interval increases.

The nature of the first aid and subsequent care are likewise of importance. Meddlesome procedures, tampering with the wound, frequent inspections without taking the precautions to protect it from secondary contaminants all add to the hazards of the initial operation. A previous attempt at repair of the wound usually forces one simply to close the area and await healing before attempting the nerve and tendon repair which might well have been accomplished if the patient could have been seen before any surgery had been attempted.

The surgeon should carefully inquire as to the nature of the wound, since this information may prove quite valuable when it comes to treatment. Rank, of Australia, has divided wounds of the hand into two groups—the "tidy" and the "untidy." The tidy wounds are such as are caused by sharp objects—glass, knives, tinplate, etc.—the incised and lacerating wounds. Such wounds are cleanly cut; they may have caused extensive deep damage with division of tendons, nerves, muscles, joint capsules, important vessels, but the wounds are relatively clean. There is no tissue disruption, and except for the actual area through which the tissue is divided there has been no cellular damage. The untidy wounds, on the other hand, present quite a different picture. These are the tearing lacerations with avulsion of tissues, jagged irregular wound borders, wounds due to crushes from heavy weight, from machines such as die machines, rollers and grinders, abrasive wheels, abrasive injuries on pulley belts which add friction burn to mechanical injury, and hot rollers such as are used in certain plastic processing plants. In this type of wound the tissues have not only suffered loss of continuity but they have also been extensively devitalized. The surgeon has to contend not only with the tissue division and loss but also with problems of wound excision which may require removal of large areas of hopelessly devitalized skin, muscle and other tissue.

Knowledge of the nature of the injury likewise gives the surgeon information concerning the foreign material that may have been introduced. Wounds sustained on the street, on the farm or in the garden may contain soil and manure, and the likelihood of anaerobic contamination is quite great. Injuries in the butchering business have a bad reputation for subsequent infection. This, however, has not been our observation in cases of acute open injuries which we have had occasion to care for from meat packing houses. Wounds from bullets and other projectiles may carry in deeply bits of clothing, wool, leather from shoes and other foreign material which may cause considerable wound disturbance. Small bits of steel such as may come from a cold chisel, for example, if they do not carry in other material are usually harmless (except for the damage they do going in), and may often be left if they are not readily accessible, since the search for them may cause more damage than the foreign body. Wood and glass, however, are never without reaction. Wood, especially, is very irritating and must be removed. Glass, likewise is irritant although not nearly so much as wood. Even large pieces may be difficult to find and only after the wound has healed may they make themselves evident by tender spots and areas of reaction.

Associated wounds may be present and may take priority in care, in which case the treatment of the hand injury must needs be curtailed. Shock is not often seen in patients with hand wounds alone, but should be watched for or anticipated where there has been extensive crushing of the hand and forearm, or where hemorrhage has been severe. We have seen it on two or three occasions and it is not without importance to be prepared for it and to prevent it, especially when some long procedure may be required.

One should never forget to inquire as to the last meal of the patient. In injuries of any magnitude a general anesthetic is preferable and it may be wise to empty the stomach by gastric tube to prevent a possible post-anesthetic aspiration.

Examination of the injured hand and of the patient should be sufficiently thorough to inform the surgeon not only as to the extent of the injury but the general condition of the patient. When the wound is uncovered for examination all precautions are to be taken to prevent secondary contamination of the wound. Masking, sterile instruments and sterile dressings are necessary, and the open wound should be exposed only long enough for the examiner to determine its extent and nature and to forewarn him of the possible extent and nature of the primary repair. A good idea can be gained as to possible need for various types of skin coverage which will be required so that the surgeon may be prepared and so that the patient may be informed if skin grafts must be removed or the hand put into a flap. The wound should not be probed and picked at to discover divided nerves and tendons. They may, of course, often be seen in the wound but evidence of loss should be secured by testing peripherally for function. Simple tests for motion often with the wound completely covered will indicate whether or not tendons are injured, while simple tests for light touch with a cotton applicator will indicate sensory nerve function. The functions of the intrinsic muscles of the hand should likewise be tested by asking the patient to abduct and adduct the fingers, to squeeze between the thumb and the side of the hand, and to oppose the thumb.

X-ray examination should be requested in all cases in which there is any suspicion of bone damage. One is often embarrassed to find at operation a fracture quite unsuspected when the patient was originally examined. It is our practice to send the patient to the operating room via the x-ray department so as to save time.

Since a high percentage of these patients are operated upon under a general anesthetic a general physical examination should be performed and blood and urine tests carried out. It is rare that patients with wounds of the hand only will be in shock or in danger of developing shock. However, this contingency must always be kept in mind. The patients who come in under the influence of alcohol must be rather carefully assessed. They are definitely not good candidates for lengthy operations under a general anesthetic and must often be given only the most basic care, to render the wound surgically clean and free of devitalized tissue and to permit primary closure. These precautions may seem unnecessary at the time, but one unfortunate experience will be enough of a lesson for any surgeon.

Tetanus antitoxin or toxoid is indicated in practically every case of open injury. There is, of course, no doubt that each case should be considered on its merits, but who can determine accurately the need for tetanus protection? In over 25 years' experience with open wounds we have never had a case of tetanus develop in a patient whom we have cared for initially. Granted the incidence is low even in the over-all picture, but here too one case is enough. Sensitivity to horse serum should be inquired into and the administration of antitoxin made to conform to the situation. Fortunately more and more patients will be found who have been immunized with toxoid and who need be given only booster doses.

Fig. 1.
Injury on emory wheel, grinding through fifth metacarpophalangeal joint, with loss of skin, tendon substance and joint capsule. Immediate cleansing, excision, repair of joint and tendon, closure by relaxing incision plus small split graft in cleft between fourth and fifth fingers. Injury and result at six weeks.

It is likewise well to ascertain from the patient if there is any sensitivity to penicillin. This drug is not given in all open injuries but will be used very frequently and patients will be found who are sensitive to it. Some of the other antibiotics should be administered if penicillin sensitivity seems to be present.

Lastly, at the time of the initial examination the surgeon should make some sort of tentative outline to be followed. This cannot be rigid but may have to be varied at the time of initial surgery and occasionally from time to time in those patients whose later care must be carried out in several stages. Nevertheless, it helps to start out with some sort of definite plan.

THE REPAIR of the wound itself, of even the most trivial, is accomplished under operating room conditions. Obviously small superficial injuries do not require to be taken to an operating room, but they must be accorded the same technique of asepsis whether they are cleansed and sutured in the emergency room or in the surgeon's office.

In general, wounds of any magnitude are taken to the operating room where they are treated under a general anesthetic with all the supplies and assistance found to be necessary. Many surgeons who are adept at brachial plexus block prefer to work under this anesthetic. We have preferred a general anesthetic since the procedures may last several hours, often beyond the period possible under plexus block. Then, too, the blood pressure apparatus may become quite unbearable under a local anesthetic and even if plexus block is instituted. Local infiltration is usually inadequate for wounds of any magnitude and makes a good deal of confusion in identifying divided structures which are often difficult enough to identify at best in a field suffused with blood.

Fig. 2.
Avulsion of skin from region of metacarpophalangeal joint, exposure of extensor tendon and division of digital nerve on radial side. Digital nerve approximated, extensor tendon covered with areolar tissue and split graft applied. A and B—preoperative. C and D—one month later.

It would seem unnecessary to add that the surgeon should be seated comfortably for these procedures which require a steady hand and arm resting on the arm board at the proper distance.

The first step in the procedure is to transform the open contaminated wound into a surgically clean wound. This is done simply by washing it with a non-irritant soap and water just as the surgeon prepares his own hands for operation. We use a simple white bar soap, not detergents, although there are some who prefer the detergents which we have felt may be too irritant. This careful washing, first of the surrounding area, then of the wound itself, carried out with the same care that the surgeon uses in his own scrub-up and for an equal period of time will render the majority of contaminated wounds surgically clean and amenable to even extensive reparative surgery. Antiseptics or any local uses of chemotherapeutic or antibiotic drugs are unnecessary and usually harmful. In the severe wound it is frequently necessary to cleanse the wound under a general anesthetic, and not infrequently a blood pressure cuff should be applied to prevent hemorrhage during the cleansing.

A bloodless field has become universally accepted for practically all operations on the hand, from the most minor to the most serious. This is secured by means of a blood pressure cuff applied rather loosely to the arm, so as not to cause venous stasis. A controlled pressure applied over a broad area is necessary, otherwise serious nerve compression may occur. The arm is elevated for about a minute and then the cuff is rapidly inflated to 280-300 mm. of Hg. This pressure, well over the usually present systolic pressure, is needed to prevent a constant trickle of blood through smaller vessels which are not otherwise effectively blocked. This broad area of pressure also will not lead to constrictor paralysis even if it is maintained for as long as two hours at a stretch. It is our practice to maintain this bloodless field during the whole initial phase of the operation, i.e., the cleansing, wound excision, identification of divided structures and the planning of reparative procedures. The wound is brought up to the stage where repair can be undertaken and closure accomplished. Then the pressure is released and warm moist pads are held firmly on the raw surfaces for five to 10 minutes. After their removal the surgeon clamps and ligates whatever vessels are still bleeding and the cuff is again inflated. The remainder of the operation is carried out, the wound closed and splint and compression dressing applied before the cuff is finally released.

In some instances, and they are very rare, the cuff is not inflated even though it has been applied to the arm. These cases are severe crushes in which the vitality of the tissues is much in doubt and in which it may be feared that a brief period of anoxia may be harmful. Even here, however, I am not too sure that this is a significant factor. It was arrived at by logic rather than experience, and I am sure that in those few cases in which it has been omitted the crushing has been no more severe than in many others in which it has been used. It has seemed to me more likely that the intense hyperemia which follows the release of the cuff may be quite beneficial in opening up some channels which were temporarily closed. Even here, however, we have not been entirely consistent in that we have never felt the need for the use of vasodilator drugs or sympathetic blocks to cause hyperemia in hands where the circulation seems poor after operation.

Following cleansing of the wound the next step is the excision of tissues which are destined to become necrotic. It has seemed to me that the main cause or factor leading to disturbed healing of wounds has been the presence in them of devitalized or dead tissues. Virulent wound infections can develop even without damaged tissue, of course—witness serious infections following needle pricks, tooth injuries, etc.; however the part played by devitalized tissues in disturbed healing in wounds of the hand is very great. Nine times out of 10 disturbed healing of a surgically treated wound is due to errors in wound excision. Granted these errors may be difficult to avoid. Adequate excision may call for removal of most of the covering tissue, for excision of muscle bellies, amputation of digits, and extreme mutilation. Most often, it is skin which is not adequately excised, first, because it is so simple to suture back large flaps and secure immediate closure; second, because the excision would present a difficult problem of closure and would seem to amount to virtual sacrifice of the hand. It is exactly here that the experience and skill of the surgeon count in salvaging the most possible from the badly mutilated hand.

One starts with the skin and proceeds in an orderly fashion throughout the tissues of the hand, removing all tissue which has been so badly damaged that it cannot survive. The skin usually presents the most difficult problem since it may still be present and can be thrown back and sutured into position and the temptation to do just that is often difficult to resist. On the

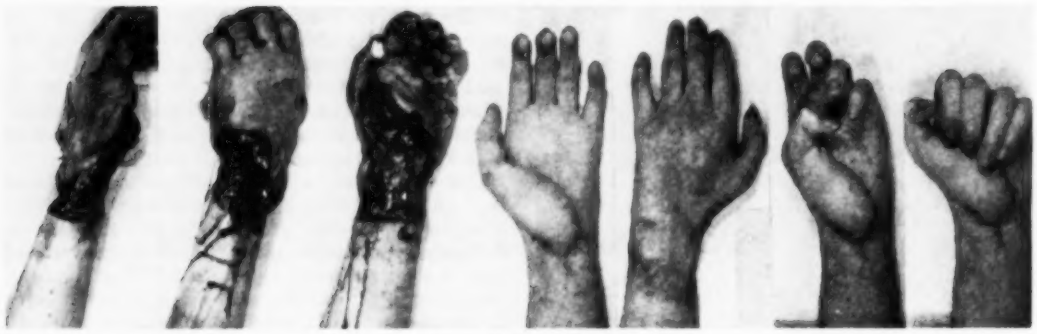


Fig. 3.

Printing roller injury. Extensive devitalization of skin, crushing and disruption of thenar and hypothenar muscles, multiple bursting lacerations. Immediate cleansing, extensive excision of skin and muscle and immediate split graft. Later a flap was placed over thenar area. Shows injury and result at end of eight months.

other hand, in case of sharply lacerated wounds there may be the tendency to excise too widely and make primary closure unduly difficult. The history of the wound is of great assistance in helping the surgeon decide on the amount of skin excision. In the case of sharply lacerated and incised wounds the skin is not damaged beyond the area of actual division and little if any excision will be necessary. In crushing wounds on the other hand there will be extensive damage to the skin, large flaps may be torn back, raised from their bed, or may have been folded back and their vessels thrombosed. It is here in the primary wound excision that the value of a history of the nature of the injury becomes apparent. If the surgeon knows that a hand was crushed between heavy steel rollers, or in a punch press or that a 500-pound weight fell upon it he will know that the skin is probably irreparably damaged and can guide his excision accordingly.

The degloved hand presents a real problem in excision in that there is the temptation to suture the skin back into position. This is always followed by disaster and renders subsequent care difficult. The second temptation is to remove the degloved skin, convert it into a free full-thickness graft, and suture it back into position. This may occasionally prove successful but it must be remembered that the skin may have been badly crushed, its vessels thrombosed, and it is likely to be seriously contaminated. A freshly removed split thickness graft will serve just as well and with more certainty, and much less bother.

One test for vitality of skin and other structures about which one may be in doubt is what we have called the blood pressure cuff test. All unquestionable areas of devitalized tissues are excised, under blood pressure cuff control in a bloodless field. Then after warm compresses are held over the wounded hand the sphygmomanometer is released and the surgeon observes the blood return to the part during the reactive hyperemia which follows. He should not be too hasty to form conclusions as to circulation. Some areas of skin and other tissues may show no bleeding for several minutes, but after five to 10 minutes of waiting one is frequently greeted by a slowly spreading blush into previously white avascular appearing skin.

Muscles, while not forming much bulk in the hand, are occasionally severely crushed or torn away from their sources of blood supply, and it not infrequently happens that the thenar or hypothenar group is avascular and requires excision. In roller injuries of the hand the muscles are often squeezed into the lower forearm, completely torn from their blood and nerve connections. They must be removed, otherwise they will liquefy and lead to serious wound disturbance until their liquified remains have been discharged. It is curious that although this muscle damage may occur in the hand, gas gangrene practically never occurs in wounds involving the hand; (the forearm, yes), and although we have seen wounds of the hand in which the entire thenar musculature has sloughed out this has been a process of liquefaction and infection, but never gas gangrene.

Nerves are obviously not sacrified unless the structures to which they go are sacrificed. Nerves possess great powers of survival and are to be conserved. If sacrificed they should be cut off high and allowed to retract into normal tissue so as to reduce the possibility of traumatic neuromata. If nerves lie exposed in the operative field and it is necessary to cover them with split thickness skin grafts, they should first be placed beneath fascia or buried in muscle since they may be very tender directly beneath a split graft.

Bone fragments are likewise not needlessly sacrificed. Tiny fragments which would be of no significance in the case of large bones may be very useful in restoring continuity to fractured phalanges and metacarpals. If there is any connection whatsoever between bone fragment and soft tissue the fragment should be saved. It is often surprising how much can be accomplished especially about joints by molding fragments into position after surrounding soft tissues have been repaired.

One of the most difficult problems which the

surgeon will have to decide at operation is that of indication for amputation of a finger. The only absolute indication is complete loss of blood supply. When it comes, however, to making the decision on the grounds of irreparability and functional restoration the decision will be quite different. This takes experience, and unless the conclusion as to restoration of function is clear cut it is usually better to wait and let the patient decide after giving the digit a "test of labor." It is often surprising how much function a poor little stump can perform. This is especially true if the hand is reduced to only two or three fingers. Where all digits are seriously involved and any single one would appear irreparable the surgeon is justified in saving one or two fingers which under other circumstances he might justifiably sacrifice as useless.

Finger tip injuries come naturally into consideration here since there is often the temptation to shorten a digit in order to make a clean amputation and to hasten healing. However, length of fingers is important and the removal of a distal phalanx simply because it is partially amputated already has been repudiated as unsound practice by all interested in surgery of the hand. The various methods of securing satisfactory healing of these finger tips after excision of nonviable tissues will be taken up later.

The thumb must be conserved to the greatest extent possible even when it is obvious that it will be an akylosed stump. An immobile thumb, even if rigid, providing it is fixed in opposition and abduction, is an invaluable member of the hand. A short remnant or stub of a thumb should be saved, even if a complicated, time consuming pedunculated flap is necessary to accomplish it.

A corrollary to excision is the need for proper care of tissues after operation to avoid dangers of necrosis developing later in tissues which were viable at the end of operation. Skin flaps may succumb if hematomata develop beneath them and cause blockage of the vessels entering and leaving. Hence, the need for good hemostasis at the time of operation to discourage hematoma formation. A resilient compression postoperatively will support the circulation in flaps, minimize edema and oozing, and favor viability of skin flaps which might otherwise succumb. Bones, joints and tendons if exposed for more than a few days even if covered by dressing are certain to die; hence the need for coverage of these structures with skin and subcutaneous (areolar or fatty or muscular) tissue.

Satisfactory wound excision having been secured, all structures identified and all visible bleeders ligated, the surgeon releases the blood pressure cuff and maintains compression on the wound with warm compresses. Decision is made at this time as to extent to which primary repair of deep structures will be undertaken. This centers especially about primary repair of the tendons and nerves and decision as to whether or not the wound is to be closed primarily. These decisions are made upon the basis of numerous factors, many of which are elicited in the earlier paragraphs on examination and diagnosis.

To begin with, the extent to which deep repair is justified depends largely upon the capabilities of the surgeon, on his familiarity with the methods of nerve and tendon repair, and on his facilities at the moment to carry out these repairs. He needs the proper equipment and help and, above all, the patience to carry out long operative procedures and extended postoperative and rehabilitative care.

The longer the interval existing between injury and primary surgery the less deep repair can be accomplished. The greater the possible degree of contamination of the wound the more modest must the surgeon be in the amount he can do. Wounds that are crushed, involving many tissues —nerve, bone, skin, tendon, muscle—are in general less amenable to primary reconstructive surgery than those in which tendons and nerves only are injured. At times the surgical repair of the hand injury must be much curtailed because of some associated injury which takes priority, e.g., a craniocerebral or abdominal injury.

A good rule to follow in the immediate repair is: *When in doubt refrain from extensive repairs; simply cleanse, excise, close, and mold the hand into the position of function on a splint in a compression dressing.*

With this start much can be accomplished later in the way of secondary repairs, while a hand can be completely ruined by ill advised primary surgery.

IF PRIMARY nerve and tendon repair is decided upon it is important to know how to expose and identify the nerves and tendons which the surgeon proposes to repair. A knowledge of the anatomy of the hand is presupposed and need not be discussed here. A word should be said concerning the exposure and identification of the structures. Nerves and tendons are found by providing proper exposure, never by probing and picking for them in the wound with hooks and forceps. The accidental wound is seldom such that the structures are readily available and must be enlarged by accessory incisions. Even if the nerve and tendon ends can be found in the wound the exposure is seldom sufficiently generous to permit operation and repair without rough handling of the nerves and tendons and forceful retraction of the skin edges to obtain even poor exposure. The accessory incisions to obtain satisfactory exposure must be made with care and thought. They must conform as nearly as the wound permits to the general principles governing elective incisions on the hand. They should avoid the midline on finger, wrist and forearm; they should follow or lie parallel to the flexion creases, and if they must run longitudinally should lie mid-laterally on the fingers, and follow the hypothenar or thenar creases in the palm and the radial or ulnar borders of the forearm.

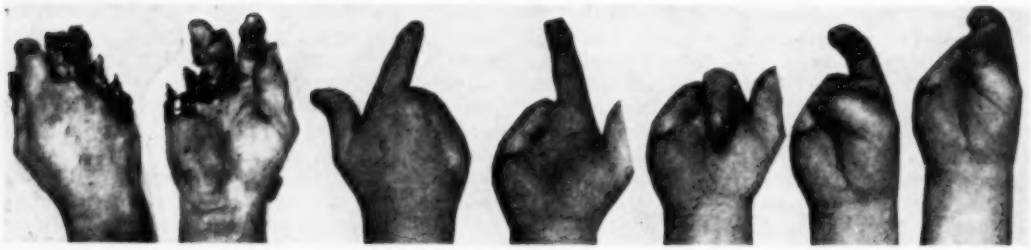


Fig. 4.
Pulley belt injury, combined crushing and brush burn, tissues charred. Immediate excision to normal tissues and primary abdominal flap. Result seven weeks after injury on return to work.

The enlarging or accessory incision may begin with the wound, at either end, and curve into physiologic planes toward the sides of wrist, forearm or fingers, or transversely or obliquely into the skin folds. At times the tendon stumps may be picked up by a separate incision proximal or distal to the wound and the ends then brought into the wound for repair. The aim of the surgeon should be so to plan the incisions that the site of tendon repair should lie beneath flaps of skin and subcutaneous tissue and not directly under suture lines.

Special words of condemnation should be directed against the vicious cruciate enlargement of wounds on the hands and fingers. These are seen especially in fingers where the surgeon, confronted with a short transverse wound with tendon division, incises across the center of the wound, up and down on the finger in the midline. There is no doubt but that this uncovers the tendons but it practically destroys the possibility of functional recovery. The initial suture is always a failure, for several reasons, and secondary repair is most difficult, complicated, and can only be partially successful. The longitudinal incision heals into a contractile scar which pulls the finger into flexion and added to this is the scar where the two incisions crossed and led to necrosis and more extensive scarring. Added to this is adhesion of the underlying sutured tendon to the overlying cutaneous scar. To correct this condition there is usually required replacement of the scar with a flap, followed later by a tendon graft and insertion of a transverse ligament to hold the tendon against the finger and prevent bow-string deformity. Examples of the mischief caused by the cruciate incision could be endlessly multiplied in any clinic which receives cases of hand injury for secondary restoration.

As to actual primary repair, each tissue requires a certain amount of special consideration. This applies especially to nerves, tendons, bones and joints and finally to the skin and closure.

Immediate nerve repair offers so much better a prognosis than secondary that it should be accomplished in every instance where it is feasible. The poor results which have been reported from initial nerve repair probably are due to two factors, namely, faulty technique of initial repair or failure to identify nerves and suture of nerve to tendon. Unless a wound is frankly infected when first seen all divided nerve ends should be identified and repaired. This applies to the small digital nerves as well as to the larger trunks, to the tiny motor rami of the median and ulnar nerves as well as to the common digital branches.

Nerves are often not easy to identify because of the bleeding that occurs into and about them. They are always in association with the blood vessels of the hand and are obscured by the hematoma and blood-stained tissues about them. The nerves themselves are usually fairly vascular and the sheath itself is suffused with blood. Then again, when the ends are found they will be soft and often irregular, difficult to handle, tear easily, and identification of sheath is not easy. Nevertheless, with patience and care they can almost always be freed and trimmed slightly (very minimal excision) and with proper instruments and suture material a good end to end anastomosis secured. Union is accomplished with fine (6-0 to 7-0) silk sutures swaged onto fine straight or curved steel needles. The sheath tissues only are approximated, stump to stump, as accurately as possible. The sutures must not pass into the substance of the nerve itself, only through the sheath. The surgeon makes every effort to preserve the original orientation of the nerve since the nerve tracts with a nerve follow down definite areas. To assist in this the two stumps, after identification, are allowed to drop back into their beds in their original position. Fine orientation sutures are then placed superficially in the sheath on corresponding surfaces of the two stumps, one suture in each stump, a centimeter back from the cut end. These sutures simply serve as guides and are removed after suture has been accomplished. With these sutures to maintain orientation as to anterior and posterior surfaces of the nerve ends the surgeon then proceeds to bring the ends together. It is advantageous technically to place the posterior or deep suture first. After this has been tied its ends are left long to serve as traction for rotating the nerve while the other sutures are placed. With the posterior suture in place an anterior suture is placed, halving the circumference of the nerve. The remaining sutures are then placed by progressively halving the distance between sutures. The number of sutures required will vary with the diameter of

the nerve being repaired. For small digital rami in the distal (two-thirds) of the finger two sutures may be all the surgeon can insert. For the large nerve trunks in the wrist and forearm 10 or a dozen or more sutures will be needed. One must secure accurate apposition so as to discourage the formation of a hematoma between the opposed ends.

Tension on the nerve suture line must be avoided. This is more likely to be a factor in secondary than in primary repairs since at the primary injury the ends have not retracted nor are the stumps bound down in scar. Nevertheless, after the suture has been accomplished the part must be kept relaxed so that the ends will not pull apart—more of this when postoperative splinting is discussed.

In instances in which the surgeon for some reason or other elects not to do a primary nerve suture it would seem advisable to tack the ends together with one or two fine sutures to prevent retraction, and facilitate secondary suture later. These sutures likewise should pass only through the sheath tissues since the more disturbance there is to the nerve ends the larger will be the proximal neuroma and the distal glioma which will require to be excised later when secondary suture is carried out.

The primary repair of divided tendons requires good judgment as to the conditions and indications and a proper technique in handling and repairing these structures. The presence of divided tendons within a wound is not in itself an indication for carrying out primary suture. Only if all the conditions for repair are suitable is the surgeon justified in carrying out suture. Secondary repair for tendons can be carried out within three to five weeks in a wound which has healed by primary intention with a good chance of success, while a primary repair that has failed reduces tremendously the possibility of successful secondary suture or tendon graft.

Time is a significant factor in determining indications for primary tendon suture. Whether, as Flynn has stated, the antibiotics have increased the time limits beyond those previously held, I am not prepared to state. It is purely a matter of contamination of the wound and the possibility of established bacterial infection. The previous time limits were established by painful clinical experience and by experimentation. Obviously, an uncontaminated wound even 24 hours old could be afforded the same care that a one- or two-hour old fresh wound would be given, but whether antibiotics would protect the latter sufficiently to permit extensive tendon surgery at 12 to 24 hours is another matter. It is my feeling that, for the present, at least, the older established time limits are safer guides, and that although primary repair is much to be desired, secondary repair can be so successful that it is hardly worth the risk of a primary repair when there is any question of securing satisfactory healing.

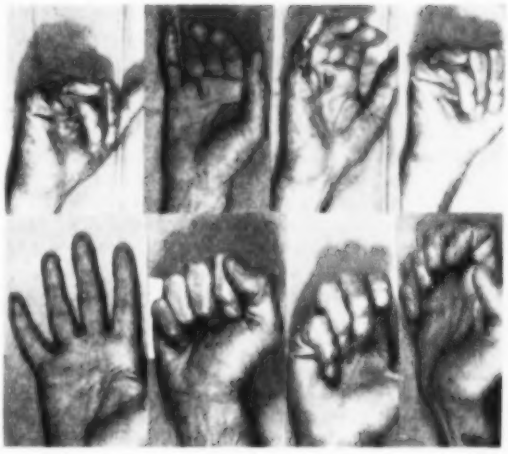


Fig. 5.
Laceration on broken glass screen two hours previous to repair. Division of both digital nerves, and of profundus tendon close to its insertion. Primary repair of both nerves and suture of profundus tendon. Result five months after injury.

In general, one should very critically consider the indications for tendon repair in wounds over four hours old. In wounds on the dorsum of the hand, and especially when no extensive accessory incisions into untraumatized tissues are required, one may overstep this limit somewhat. In the case of flexor tendons within the sheath of the finger proximal to the sublimis insertion I feel the time limit should be much more restricted and the conditions of repair even more strict. Certainly in a wound of this type over two hours old, one would hesitate very much on attempting primary tendon suture. Even with wounds of two hours or under in this location one would not attempt primary tendon suture except under the best of conditions. A good many surgeons experienced in surgery of the hand advise against primary tendon repair in the digital sheaths of the fingers over the area above outlined, which has been called the "no man's land." They advise simple closure of the wound and, after healing, repair by means of tendon graft. Certain it is that most tendon divisions in this location are seldom seen early enough or under conditions sufficiently suitable for suture. They may be obviously badly contaminated or, what is just as definite a contraindication to tendon suture, have been tampered with elsewhere. In such instances the surgeon has no choice but to cleanse and close the wound.

In most instances, regardless of the location of the wound, if another surgeon has already exposed the wound and, upon discovering the tendon damage, simply closed or dressed the hand and sent the patient in for immediate tendon repair one always elects to await healing and accomplish repair as a secondary procedure.

Tendon repair, especially of the flexor tendons, is rarely feasible in wounds associated with open

fractures or with severe crushes with or without fractures. Tendon callus is certain to become adherent to bone callus and the tendon repair will require to be taken down later and a graft inserted. If we are not having to contend with bone callus and the adhesion of the tendon to it, the repaired tendon will adhere to surrounding soft tissues, especially to the fibrous tendon sheath, and neither of those will loosen up spontaneously. Over the dorsum of the hand or fingers one may at times repair the extensor tendons even in the presence of open fractures.

The area of tendon repair must be covered with a good skin flap after operation. If the skin has been destroyed or must be sacrificed over the area of tendon suture and a rotation flap cannot be provided for it, tendon repair is contraindicated. A split graft cannot be laid over the site of tendon suture with the expectation of either the graft taking well or the tendon repair surviving. Rarely it may be possible in case of the dorsal tendons to shift a layer of areolar tissue from the periphery over the sutured tendon and to lay a split graft over it. It is not possible to carry out primary tendon suture and then place the hand under an abdominal flap to cover the area. The position in which the hand and wrist must be held to secure relaxation of the sutured tendon can scarcely be maintained with the hand under an abdominal flap.

One should not need to mention that the surgeon who undertakes tendon repair should be fully acquainted with the various techniques and have available the proper instruments and suture material for the repair. A few general observations however may not be amiss concerning the general principles of repair and tendon healing.

TENDON consists of long strands of collaginous tissue loosely held together by fibrous tissue. Blood vessels enter at the periphery at places where the tendon runs through paratenon or at lines of attachment of the mesotenon. Contrary to much expressed opinion, the tendon possesses blood vessels which run longitudinally through it. Tendon is extremely easily disrupted by handling; it frays out into strands which may tear up for several centimeters into the stumps. It must therefore be handled with great gentleness and care, for despite its tremendous tensile strength to longitudinal pull it will turn into a bundle of soft wet string if it is pinched or squeezed. Suture then becomes a true surgical nightmare.

Tendon heals in three phases. First, a fibrinous or gelatinous exudate glues the stumps together. At the same time the stumps themselves become soft, vascular, so that sutures introduced into them have very little holding power after the first day or two. This fibrinous phase lasts about four or five days and then the fibrinous tissue is replaced by the ingrowth of fibrous tissue. This tissue which is simply soft scar tissue is not sufficiently strong to withstand use. If too much strain is put on it at this time just short of that

Fig. 6.
Laceration with division of flexor pollicis longus, and both digital nerves to thumb. Immediate repair. Result two months later.

required to rupture it, the tendon callus becomes progressively larger as if to compensate for the weakness of the tissue, the callus becomes thicker, and a large bulbous adherent union results. This fibrous union (really scar tissue) begins on the fifth or sixth day and extends up to about the end of the second week. At this time the callus is invaded by tenoblasts or, if one will not concede the presence of such cells, the callus matures, i.e., it takes on the character of true tendon. By the end of the third week this process of maturation is well under way and the healing tendon will take on the character and strength of normal tendon. It will withstand use which must still however not be too great for a few weeks.

It is obvious that we depend for firm healing upon the tendon tissue itself and that to heal well this tissue must be as little traumatized as possible and that the sutures we introduce into the tendon must be fine and cause little disruption of the tendon. Healing will depend upon keeping these ends together largely by proper relaxation, rather than depending upon sutures, since in the early stages the sutures pull through if much stress is put on them, and separation occurs. Later on during the second week if any stress is put on the healing tendon it reacts by becoming thick and bulbous, or it may separate, in the one instance leading to firm adherence to surrounding structures, and in the other to destruction of its function by separation. Since about three weeks are required for firm union to occur, this is the period of time during which tendons should be kept relaxed by splinting to secure firm enough union to permit function.

As to the materials and technique of tendon suture it would seem that the actual method of introducing sutures or as to whether the suture be steel wire, silk or cotton is not so important as that they be of fine size and that if silk or cotton be used it be untreated so as to contain no irritants. It is probably best not to load the proliferating tendon end with great amounts of suture material, just as one doesn't crowd the skin edges with sutures and place knots between the two lips of the incision. Tendon has been too often looked upon and handled as rope; it is, in fact, very sensitive living tissue which heals as all living tissues heal but reacts poorly to injury

and quickly succumbs to exposure and crushing. If we would be successful in handling it, we must treat it with respect.

Joint capsules are always closed. There is frequently a fracture associated with open joint injuries and in such instances the joint surfaces are molded into the best position possible before the soft tissues are sutured.

Fractures should be reduced at the initial operation. In a large number of instances this can be accomplished by molding the hand into the position of function over a splint. The fingers are individually molded into position of grasping, the thumb rotated around into opposition, and the wrist dorsiflexed. This position is maintained on the splint by the compression dressing.

The final step in the procedure is closure of the wound. This we feel is of paramount importance and must be accomplished regardless of the difficulty. There are very few reasons for leaving a hand wound open at the time of initial care. In the case seen late with an already frankly infected wound, closure at the moment is out of the question. In the rare case in civilian practice, but more often in military surgery in time of war, it may be expedient to leave the wound open. But in these cases it is simply a matter of delaying closure for a few days until the circumstances are more propitious. Wounds seen too late, wounds very severely contaminated, wounds due to explosives, wounds for which immediate after care is not possible, such wounds may occasionally be left unclosed at first operation and closed four or five days later. In wounds of this sort cleansing and excision are carried out just as carefully as for those in which primary closure is to be done, but no deep repair is undertaken.

Practically all hand wounds in civilian practice, however, should be closed at the first operation. The longer they remain open the more certain they are to become infected, the more granulations pile up and the greater the amount of residual fibrosis.

Closure should be accomplished if at all possible with hand skin; no skin replaces skin of the hand as local skin. For this reason every effort is made to save all viable tags, to fillet fingers which require amputation and sacrifice nothing until the end of the operation. It will often be found possible to dovetail flaps into each other and to obtain closure by suture. This admonition to save flaps does not apply to avulsed and crushed skin which was sufficiently discussed above.

IN INSTANCES in which coverage cannot be obtained by suture the surgeon has recourse to various plastic procedures. By far the most valuable is the thick split graft. For small areas such as finger tip or postage-stamp-sized defect elsewhere, a graft can be removed from the volar surface of the forearm. No special equipment is needed for the removal of these tiny grafts; a sharp scalpel or razor blade is adequate. For larger defects the skin may be removed from the thigh by whatever technique the surgeon prefers.

In the vast majority of instances where skin coverage is required the split graft is the choice. Where bones, joints and tendons are exposed however the split graft is not suitable. Very occasionally it is possible to shift areolar tissue from the surrounding areas to cover the exposed bone, joint or tendon and then lay a split graft over it. Usually, however, some sort of flap will be required. In a large percentage of such instances a rotation flap can be used. With experience the surgeon soon learns to shift a flap of skin from the border of the defect to cover over the desired area, and then to lay a split graft over the donor area of the rotation flap. We have found ourselves using this technique more and more, even though a flap may not cover the entire defect. If it covers the essential structures all other areas can be taken care of with free grafts.

If the above noted methods of coverage cannot be used the final solution is the pedicle flap. This is not always a happy solution, especially in cases where there are fractures or where nerve and tendon repair are needed, since it is difficult to maintain proper position with the hand attached to an abdominal flap. Then, too, an immediate or primary flap must often be made quite thick and large to insure good blood supply. Nevertheless, the time comes when the only solution to covering exposed bones or tendons is a flap, and under these conditions a flap should be applied without hesitation.

The primary operation is completed by the application of a compression dressing and a splint. The compression dressing, I feel, is an integral part of the treatment. Experimental studies notwithstanding, I am convinced it is a great aid in keeping down postoperative, posttraumatic edema and swelling. Anyone who has seen a seriously mangled hand treated, closed and put on a splint under a correctly applied compression dressing can imagine what that hand would look like under ordinary dressing care. When that hand is dressed for the first time, five or six days or even later, there is little or no swelling; the palmar concavity is preserved, the suture lines are flat, and skin grafts are evenly applied to the surface. The compression dressing accomplishes several things. It puts the tissues back into their normal relationships, supports venous return and thus aids circulation; it minimizes swelling and oozing and obliterates dead spaces. It must, however, be correctly applied. It is resilient and firm, not constricting or tight. It requires large amounts of fluffed-up gauze or other resilient compression material. It is thoughtfully applied, not just piled on haphazardly. Several points should be emphasized. The fingers must be separated from each other by several thicknesses of gauze to prevent maceration as well as to avoid the pressure of bony prominences of joints against each other. Between the thumb and side of the palm there should be placed a special ball or wad of gauze

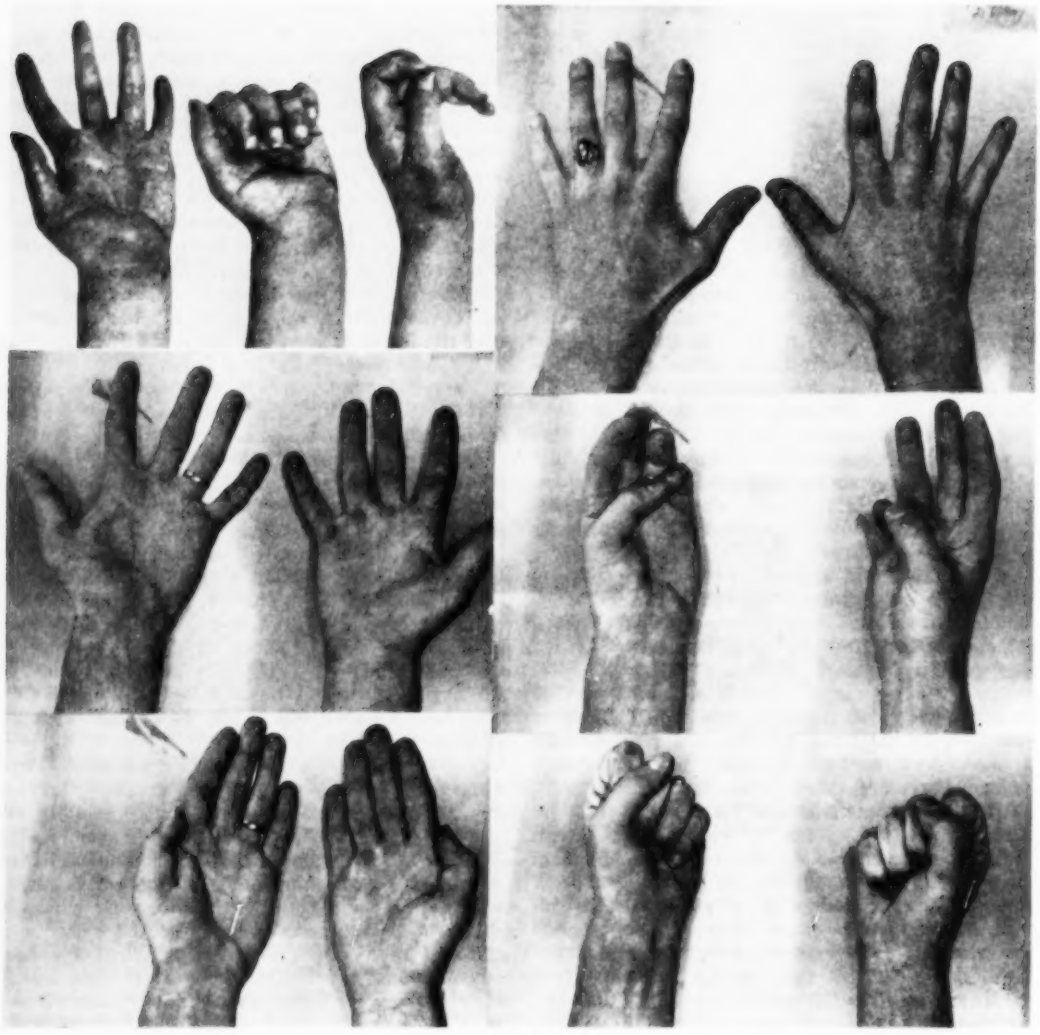


Fig. 7.

Division of median and ulnar nerves, and of all flexor tendons of fingers and thumb. Immediate repair. A, B and C —result at end of three months. Remainder of pictures show result in June, 1947, 12 years after the injury. Except for the scar little difference can be detected between the injured and the uninjured hand. Shows the effect of time and use in regaining function.

to keep the thumb away in the position of function. There must be adequate padding over the metacarpophalangeal joints and especially must the surgeon note the lateral border of the second metacarpophalangeal joint, the radial side of the first metacarpal and the ulnar styloid. These three spots may escape adequate padding while the bandage is being applied and pressure necrosis may occur. Then, too, the elastic bandage, while helpful, is not a *sine qua non* for a compression dressing. An adequate compression dressing can be applied with an ordinary cotton bandage providing the dressing is sufficiently thick and resilient. It is difficult to teach the neophyte that it is the thick fluffy dressing that counts and not the elastic bandage. Too often the whole reliance is placed on the elastic bandage with much too little dressing beneath.

CONCURRENTLY with the application of the compression dressing is splinting of the hand. The reasons for splinting are obvious, but it is not generally realized how important proper splinting can be for eventual functional restoration of the hand. The splinting of the hand in proper position, following primary surgery, may make the difference between a hand that is useful and one out of which even the most skilled surgeon can fashion nothing useful. In general, where the whole hand is to be splinted (and in

most extensive injuries this must be) it should be placed in the position of function. Crushes, multiple fractures, burns, etc., should all be splinted in the position of function, i.e., the grasping position. If it is not necessary to splint the whole hand, whatever part is to be splinted, a finger or two fingers, the wrist or the thumb for example should be placed in the functional position. The wrist should be dorsiflexed 30 to 40°, the fingers flexed about 15° at all joints and abducted about 15° from each other; the thumb swung around in a grasping position facing the hand. If nerve and tendon repair has been carried out, however, the position of splinting is usually different from the position of function, since one must relax the sutured structures and the paralyzed muscles. Following repair of the flexor tendons the greatest relaxation is secured at the wrist which is held flexed at about 45°, while the digits are flexed about 15° at each joint. Following suture of the extensor tendons the wrist is dorsiflexed about 15°, while the digits are also extended but not quite to 180°, since this is a very poor position in which to immobilize the fingers because of the subsequent fibrosis which is sure to occur in the digital joints if they are immobilized straight out.

The situation regarding splinting following nerve suture is again different. Here there are two considerations. In the first place, the sutured nerve ends must be held relaxed and without tension for at least three weeks, to permit firm union so that they will not pull apart and thus lead to failure of the suture. If the repaired nerves have motor components it is necessary to provide relaxation of the paralyzed muscles for a sufficiently long time to permit their reinnervation. It thus often happens that the initial splint applied to maintain relaxation of the sutured nerve ends is replaced at the end of three to five weeks by a second splint to relax the tiny intrinsic hand muscles until they have regained their innervation, a process which may require a number of months. These special splinting problems will be alluded to in the discussion of after care.

THE AFTER CARE following primary suture has to do with the immediate management of the hand and wound until healing has taken place and then with the guidance of the patient throughout the time required to restore function. First we must secure healing and then function.

Following operation the hand is kept elevated above the heart level on a pillow, rarely in a suspension apparatus, and the surgeon inspects the circulation in the fingers from time to time. As soon as the patient is allowed to be up the arm is carried in a sling but the surgeon should pay some attention to the shoulder, which may stiffen up unless the patient is encouraged to keep it in motion. Some surgeons, notably Moberg, have warned of this shoulder stiffening complication (shoulder-hand syndrome), which may follow long continued use of the sling.

The need for antitoxin or toxoid has been discussed previously, and I have also alluded to the use of antibiotics. While we feel that tetanus protection is indicated in practically every wound, it does not by any means follow that the antibiotics must be given just as universally. I suppose one could just as logically argue that tetanus protection does not require to be given in every case, but that the determination of the indications for giving it is difficult or impossible. It is not quite the same in the case of the antibiotics. The essentials in the care of the open wound are cleansing, excision, closure, and splinting. Only where the contamination has been so serious, the likelihood of infection so great, and the probability of efficient excision so minimal is antibiotic therapy really indicated. In the pre-antibiotic days the entire reliance was placed on proper initial care, even in the most seriously injured, and primary healing was secured in the great majority of cases by primary intention. This does not mean that the antibiotics are not to be used. It merely means that antibiotics are often given needlessly, but that reliance for good healing should be placed not on drugs but on the care with which the surgeon carries out initial surgery.

Dressings are changed usually on the fifth day, largely because the hands often sweat and maceration may occur. Also in a fair percentage of these hands we insert tiny strips of sheet rubber, several inches long but only two or three millimeters wide, and these should be removed on the fourth or fifth day. Then, too, an occasional suture may be too tight and should be snipped. Care is taken at the initial dressing not to disturb position of wrist and fingers if nerves and tendons have been repaired. Sutures are usually removed about the eighth to tenth day and, at this time, in the absence of fracture or nerve and tendon repair, splinting may usually be dispensed with.

Splinting in the case of fractures of the finger or metacarpals is maintained for from three to four weeks; at which time they will usually be found to be consolidated. Carpal fractures and Bennett's fractures require a longer period of immobilization. Fractures of the proximal phalanx of the thumb likewise usually require long immobilization, and are prone to non-union so that the surgeon must often resort later on to bone graft to secure union.

Immobilization following tendon repair must take into consideration the rate of healing of tendons. Firm union usually requires three weeks and even then too active use for the first week or so after this should be restricted. It is my practice therefore to keep flexor tendons immobilized completely in relaxation for three full weeks after repair. Then for a further week the patient wears a splint over the dorsum of the wrist which keeps the wrist slightly flexed but allows the fingers free motion. At the end of this week the splint is removed and the patient instructed to wash

his hands four to five times daily for five or six minutes in warm soapy water and to use the hand in the ordinary acts of daily life. Strenuous use is avoided for another week or two, since sudden action may cause tendon rupture or lead to excessive reaction at the site of repair.

The same general plan is followed in the case of the extensor tendons except that the immobilization is prolonged for about four weeks instead of three, and restricted motion for a further week to 10 days. These patients also are requested to wear their splints at night for an additional two to three weeks.

The fibrous union at the site of nerve suture is usually firm at the end of three weeks, and splinting may be discontinued for nerve suture at this time. However, it must be remembered that if motor nerves are affected the muscles innervated by them should be kept relaxed for as long a period of time as is required to restore active motion. Hence splinting must be devised which the patient can wear constantly for a number of months.

Use of the hand is encouraged just as soon as the tissues will stand it. Obviously uninvolved parts are moved at once and other parts as soon as the immobilizing appartus is removed. If possible we try to have the patient give himself his own physical therapy. "Home soaks" are started as soon as dressings are discarded. These consist in simply washing the hand in warm soapy water five or six times daily for four to five minutes. This simple exercise causes the patient to move the various fingers, supplies heat and therefore improves the circulation and the motion of the fingers pumps venous blood from the hand upwards through the forearm. We try to impress on the patient that just waving the fingers in the air is not exercise. The forearm muscles must be used, and the patients are taught to feel their forearm and to see to it that the flexor and extensor muscles contract vigorously. Dish washing is a good home exercise.

As soon as fair use is established the patient is returned to work, if work can be given him. So often in these cases work is not forthcoming, either because the employer has no work temporarily suitable for a man with a partially disabled hand, or, what is not too infrequent, seniority rights prevent the man from securing work commensurate with his ability and require that he return to the exact work he was doing when he was hurt.

One should not forget the shoulder in these cases. The patient should be instructed to keep the shoulder active so as to prevent stiffness and often pain which may ensue. The shoulder-arm syndrome, while frequently discussed in the literature, has occurred in only one case in our experience—a Negro, whose injuries involved the distal phalanx of the thumb and required that a small postage-stamp of skin be used to cover the defect which could not be closed by suture. Despite excellent healing of the graft over the thumb the patient developed a painful shoulder and a stiff swollen hand. The condition is only mildly responsive to treatment and is still present six months after injury. This might have been prevented by more careful attention to the patient after operation. The surgeon should take a personal interest in the patient, should chat with him from time to time, should encourage him and never let him feel that he is just a small entity in a busy practice.

Finally, one word should be given as regards prognosis. The functional end results of these hand cases can often not be determined for a long period of time following repair. This is especially true of nerve and tendon repairs. The result at the end of three months may be satisfactory, at six months it may be good, but at 12 to 18 months it may be excellent. Often improvement goes on over a period of three to five years. This is not just the increased dexterity which a patient with a disabled hand develops, but the improvement in tendon motion and nerve recovery which progresses slowly and almost imperceptibly.

Presented at the meeting of the INDUSTRIAL MEDICAL ASSOCIATION, Section on Surgery, Los Angeles, April 23, 1953.

Office Accidents

LAST year the Metropolitan Life Insurance Company, which makes a business of keeping careful records of everything, reported about one accident per working day in the home office. People fell on stairs and ladders. Some suffered back strains caused by improper lifting or by attempting loads that were too heavy. Heads were bumped on open cabinets, doors, and files. Careless people were hurt on desk drawers or by colliding with others in halls and corridors. Nearly a fifth of the injuries were cuts and scratches. No office is immune to accidents. Even the National Safety Council headquarters, where safety is gospel, has had its share of mishaps. An unusual one involved a glass water pitcher that focused the sun's rays on desk top. Result: a charred desk and several scorched papers. That fire warning resulted in frosted glass pitchers being substituted for the clear glass ones.

—From "Look Out for Office Accidents," by CHARLES F. ALEXANDER, National Safety Council, in *Office Executive*, August, 1953.

Lead and Lead Poisoning in Early America

BENJAMIN FRANKLIN AND LEAD POISONING

CAREY P. McCORD, M.D., Ann Arbor, Michigan

This is one of a series of nine items, the totality of which constitutes a substantial history of lead and lead poisoning in early America. Other items will appear as the documentary information becomes complete. DR. MCCORD *is Consultant, Institute of Industrial Health, University of Michigan, Ann Arbor, Michigan.*

BEGINNING just prior to the American Revolution, a revival in medical appreciation of lead poisoning was inaugurated in Europe. Long before that time Colonial Americans had been plagued by that disease, then termed the "dry gripes," but many obscure epidemics never were associated with lead as the cause. One of America's early commercial industries, rum distillation, provided the major exposure. Much rum was grossly contaminated from distillation through lead worms and still heads. Whether the rum was distilled in the West Indies or in New England the disorder was common. This was no occupational disease. This was a consumer affair. Not necessarily was there "demon rum," but truly there was a demon in the rum. Sorely America needed its own revival.

The European revival was signalled by four publications beginning in 1767. None was sufficiently early to have influenced the first century Colonial America. These striking publications were by Baker (1767) on The Devonshire Colic; Hunter (1788) on the "Observations on the Diseases of the Army in Jamaica"; Tranquerel des Planches on cases in La Charité Hospital in Paris; and Rumpelt (1845) in Germany in his "On Lead, and its Action on the Human Body." This last, in some sections, provides a pronounced similarity to Tanquerel.

Indeed, prior to 1767 there appeared a series of publications dealing with the "Colica Pictonum," a strange malady of Southern France, now known to have been lead poisoning. This series began in 1616 with the celebrated work of Citois. Citois was fully unaware of the precise cause of the colic he so ably described. Then in 1754 came Dehaen with his dissertations on the colic of Poitou. Without guile, Tanquerel in praising Dehaen, deprived him of the inaugural position in the revival through this language, "In the legitimate etiology of this affection he may be inexact." Theodore Tronchin, in his 1757 treatises on Poitou colic, was close to exactness but his pronouncements lack finality. The Poitou group furnished many leaden sparks but no conflagration. That waited 10 years more and then—Baker of Devonshire.

Understandably almost all medical theories and practices applied among the early colonists were of European origin although the settlers quickly espoused some that were good from the little scientific measures of the American Indians. The pronouncements of the English physician, Thomas Sydenham (1624-1689) dominated medical America for about a century beginning near 1650. Much was in the Sydenham tradition.

Certainly any consideration of lead poisoning among the first whites in America and for about 150 years after the first arrivals, derived from European information. Readily the impact upon medical Europe by the final disclosure that the mysterious Devonshire Colic was not other than lead poisoning might have been borne to America for American medical acceptance.

In this presentation the belief is that just the opposite may have occurred, that the flow of immediate scientific stimulation that provoked the revival may have been eastward from America to England. The Devonshire Colic epidemic raged for about a century, terminating in 1767, the year that Dr. George Baker made known his discovery of lead as the source of the scourge. At that period Benjamin Franklin was near to his scientific zenith. His journeys to and his activities in Europe had made him better known there than in the totality of his own country. Franklin, although a medical layman, knew much about lead poisoning. The role played by Franklin in disseminating this information may have been such as to establish him as a precursor of the European revival. This present section has sought out some of the evidence.

What Benjamin Franklin Knew About Lead Poisoning

WHEN in 1745 Franklin, the printer published Thomas Cadwalader's "Dry Gripes," he procured for himself a lifetime passport into the halls of medicine. The dry gripes became one of his lasting conversation pieces and the subject for pamphlets. Dr. Cadwalader was one of Franklin's medical intimates in Philadelphia, though at the time of the essay he was temporarily re-

siding in Trenton, New Jersey. The two were associated in numerous medical enterprises. It is difficult to believe as to the "Essay on the West-India Dry Gripes" Franklin was a mere publisher, but Franklin's name is not mentioned other than as a publisher. In writing this dissertation, Cadwalader was little describing lead poisoning in the West Indies, where in truth it was common, but was using that term as others to this day speak euphemistically of "German" measles or of "Spanish" influenza. Cadwalader was describing the disease as it occurred in Philadelphia and surrounding cities where the affection was prevalent. The only recorded cause was leaded Jamaica rum.

It is not known that either Franklin or Cadwalader ever visited the West Indies, but Franklin had printing interests both in Kingston and Antiqua. Cadwalader's "Dry-Gripes" was little mentioned in the early decades after its publication. Only historically has it become important. Cadwalader was the author, but publisher Franklin pre-empted the credit.

After 1745, Franklin began to recall, or at least to bruit earlier episodes within his own experience that located lead poisoning with certainty within the colonies as early as 1723. By one of those odd coincidences that permeate all of Franklin's identifications with lead poisoning, it came about that the very month in 1723 that Franklin at the age of 17 became a runaway from Boston, the Massachusetts Bay Colony legislators in Boston were enacting that famous law regulating the still heads and worms for rum distillation. That legislative enactment (later to be presented in full) may have been the initial motivation to the renaissance in lead poisoning which is the thesis of this present report. Many years later, Franklin in writing about plumbism refers to his first knowledge, gained as a boy in Boston, from a "general discourse." It is possible that the general discourse centered about preliminaries eventuating in the legislative restrictions. In another writing, Franklin precisely refers to the Massachusetts law.

In 1724 when Franklin was in England after his first crossing of the Atlantic on that ill-advised but still profitable journey, he went to work as a printer at "Palmer's." Here it was that he was told of the undesirability of heating type as part of the cleaning operation. It appeared that some malady arose which today would be termed lead palsy; "Dangles" is the term applied by Franklin. That incident apparently stirred Franklin to recall something similar, earlier observed by him in America. Thus Franklin may have been the first to associate lead poisoning with the printing trades. Even so, it is manifest that his was no succinct scientific recording.

Ever afterwards Franklin was governed by the awareness of the dangerous properties of lead. This may be exemplified through reference to that period when Franklin was developing the "Franklin" or "Pennsylvania" stove. Within its descriptions may be found the observation that iron when heated, unlike lead, emits no noxious vapors.

By twentieth century standards, all foregoing may seem to constitute only a scanty familiarity with lead poisoning. Yet, when Franklin sojourned in England beginning in 1757, possibly he was better informed as to lead poisoning than any physician in that country at that time.

The European Revival in Lead Poisoning Awareness

FRANKLIN was not a physician. His doctorate was an honorary one and perhaps there was more than one doctorate degree. Avoiding that controversy as unconnected with present objectives, it is beyond debate that Oxford University conferred an honorary "Doctor of Civil Law" degree in 1762.

In early Colonial days, and reaching into Franklin's times, every learned person was looked to for medical guidance. A few successful physicians had no formal training and no qualifications beyond self-annointment. Franklin did not practice medicine. He only reached into it and influenced it. He himself invented bifocal lenses, devised a flexible catheter, and wrote about gout, the temperature of blood, sleep, deafness, nyctalopia, the nature of the common cold, infection from dead bodies, death rates in infants, and on the treatment of nervous diseases by electricity.

During all mature periods, Franklin consistently was associated with physicians. This was true for Philadelphia, London, and Paris. He was admitted to active or honorary membership in many national medical societies, although in totality into a larger number of non-medical scientific and philosophic bodies. In the world of physics, Franklin's forte was electricity. In medicine, one of his fortes was "dry-gripes."

No newness attends this report's continuing allusion to Franklin's knowledge of lead poisoning. Every biographer is well aware. What newness is here present and what has been signalized is the impact of Franklin's information on the European revival. If he did not engender all, he touched all either profoundly or lightly.

In assigning to Franklin a major role in the revival in Europe of respect for lead as a damaging agent, it may be agreed his activities were not requisite. He was not the essence without which inquiry could not have been prosecuted. Even at that time the reservoir of data on lead poisoning was rich, beginning at least 1000 years before Christ at the silver mines (with lead as an impurity) at Laurium in pre-Athenian days. Will Durant has written: "Laurium pays the price of the wealth it produces, as mining always pays the price for metal industry; plants and men wither and die from the furnace fumes, and the vicinity of the works becomes a scene of dusty desolation." In no generation for the 2700 years thereafter was it impossible that physicians could have known about the bodily threats

from lead. The literature accumulation by Baker's and Hunter's time was extensive but not surely available to them. Decades later, Tanquerel lists such an imposing lot of source material as to put most modern bibliographers of lead to shame. Sydenham, of England, Baker's predecessor, described lead poisoning with which both Baker and Hunter must have been familiar and which Tanquerel mentions. Baker mentions Tronchin who scarcely antedated him and was well conversant with the ravages of Colica Pictonum. Notwithstanding all of these circumstances that made Franklin non-essential, Benjamin Franklin was a timely pervading catalyst at the moments of the lead revival. The entwinement of circumstances is portentous.

Franklin was first identified with the Royal Society of London when in 1753 he, in absentia in America, was awarded the Copley medal for his investigations of electricity. Returning to London in 1757, he widely participated in the Society's affairs and importantly was an habitue at the Royal Society Club, a sort of esoteric dining group, more difficult to attain than the Society itself. There he was sponsored by Sir John Pringle. In a single year the minutes of the Club note that Benjamin Franklin attended 18 of the weekly dinners. Now observe. In 1762 Dr. George Baker, he who soon became famed as the discloser of the cause of Devonshire Colic, became a Fellow of the Royal Society. In 1766, before the Devonshire denouement, he was admitted to the innermost circle—the Club. All along there was Franklin and his "dry-gripes." This ties Franklin to Baker.

Lest there be disposition to question any influence of Franklin on Baker, let certainty appear in Baker's own writings (1768). In his "An examination of several means by which the poison of lead may be supposed frequently to gain admittance into the human body, unobserved, and unsuspected" is found:

"It seems not improbable, that, if we had an opportunity of making an accurate inquiry, we might see reason to conclude, that the disease, called popularly the dry-belly-ach, which is common as well in the northern colonies of America, as in the islands of the West-Indies, ought to be referred wholly to lead, as its cause.

"My suspicions, concerning this subject, have been greatly confirmed by the authority of Dr. Franklyn of Philadelphia. That gentleman informs me, that, at Boston, about forty years ago, leaden worms were used for the distillation of rum. In consequence thereof, such violent disorders were complained of by the drinkers of new rum, that the government found it expedient to enact a law, forbidding the use of any worms, except such only as were made of pure block-tin. This law having been enacted, the dry colic was much less frequently heard of than before. But the law was complied with only in part; for from that time to the present, instead of block-tin, they have used a pewter, containing a large portion of lead. Dr. Franklyn likewise informed me that the colic of Poitou is not so frequent a disease in any of the colonies, as it was formerly; and that the reason, commonly assigned, is that the people now drink their punch very weak in comparison with that what they were formerly accustomed to; which used to be rum and water in equal quantities. He added, that they now also drink their punch, with more juice of fresh limes in it; and, as that juice, joined to certain laxative medicines, is at present their common remedy, when any are seized with the disease, so it is generally considered as the best preservative against it.

"I am likewise informed by a gentleman, who resided many years in the Bahama-islands, that the dry-belly-ach has hardly been known in those islands, since the inhabitants have left off the distillation of rum. The same gentleman informs me, that the people of the Bahama-islands drink very large quantities of small punch, made extremely acid by the juice of limes, many of the labouring people to the amount at least of two gallons every day.

"It is hoped, that what has here been thrown out concerning the most probable cause of the colic, which is endemial both in the West-Indies and on the continent of America, may appear to those, who have opportunities of making a more accurate inquiry to be not unworthy of their attention."

Since so much mention has been made of the Devonshire Colic, it becomes pertinent briefly to synopsize that catastrophe and particularly so since its raveling by Dr. Baker became the first flowering of the European revival in lead poisoning. For many decades and perhaps for more than a century prior to 1767, a strange illness ravaged the population of Devonshire, an English county on the southwest coast. In the beginning, the cause was attributed to foolish things such as the east wind, the soil or the stars. A quotation reveals the plight of the people.

". . . . there were found throughout the town, people who were just like ghosts or statues. Walking artificially, pallid, squallid, lean, with their hands crooked and hanging under their own weight, not being raised to the mouth and other higher parts except by effort (practice, skill); their feet not their own, but the muscles of their shanks making their gait laughable if (it were) not so pitiable, their voice harsh and halting. . . ."

Long before Baker's time it had been determined that in some manner the drinking of "cyder" was related to the cause. Again a number of theories appeared—particularly from the distinguished Dr. Huxham. The acid of the fruit was suspected—sour pomace, overripe apples. The people of nearby shires made and drank cyder, but practically no malady appeared.

Dr. Baker was a native of Devonshire. By 1761 he began to have some notions as to etiology. Already he had associated with Benjamin Frank-

lin. Perhaps he reasoned—but here words are being put into his mouth—that "since Benjamin Franklin found that rum was contaminated by lead and thus 'dry-gripes' came about, why could it not be that cyder is in some manner brought in touch with lead since clinically the pictures are identical?"

At any rate, Baker prosecuted his theory. Many investigations were conducted. Soon it was disclosed that in Devonshire, and almost exclusively so, their large mill stones were hewn in segments and then bound together into a unity by keys prepared by the pouring of molten lead into properly excavated "pockets" in the stones. The exposure was abundant. Much lead was demonstrated in the cyder. There was the source of Devonshire Colic!—Lead leached out of or ground off of the mill wheels. The disclosure was complete. The report made in 1767 was perhaps the first achievement in scientific epidemiology.

Dr. Baker—the native son—was roundly condemned by the clergy, by the mill owners and by some of the medical profession. A little later he was knighted, became one of the royal physicians, and repeatedly was president of the College of Physicians. Some of these times Franklin was in England and perhaps was more than a passive onlooker.

There is no difficulty in linking John Hunter, the next contributor to the lead poisoning revival in Europe, with Dr. Baker, because in 1788 Hunter presented his text, "Observations On the Diseases of the Army in Jamaica" to Sir George Baker (newly knighted), and then president of the College of Physicians. Almost equally exact was the linkage with Benjamin Franklin. During the first portion (1781) of his tour of military duty in Jamaica, England was at war with the colonies and thus not expectably was there any communication between these two gentlemen. By the time of the Hunter publication in 1788, the war was over. Politically Franklin was anathematous to England, but scientificaly he was the "revered master." The John Hunter of dry-gripe fame was not England's celebrated John Hunter (1728-1793), the anatomist and surgeon. The two were contemporary, thus the separate identification of Franklin with the doctors Hunter becomes difficult. Sufficient linkage is established in "dry-gripes" Hunter's book in this language:

"I cannot deny myself the pleasure of inserting in this place, a letter from Dr. Franklin to his friend Mr. Vaughan, in which the opinion I have advanced, respecting the cause of the colic in the West Indies, is illustrated and confirmed in some degree by what happened in New England. Though several of the facts mentioned in the letter are already before the public, I have not chosen either to abridge it, or give it in other words than those, in which the doctor so clearly expresses himself."

Then follows the well-known Benjamin Vaughan letter from Franklin which will be introduced later.

So vivid and so accurate are Hunter's descriptions of lead poisoning, that a few excerpts from his book now follow to indicate the high quality of his writings:

"The palsy may be considered as the second stage of the disease. It seldom follows the first attack of colic, and not often the second, unless it has been violent; but few escape more or less of it after a third, or fourth fit. The palsy comes on as the pain of the bowels abates; the sick complain of pain and soreness in the arms, especially about the wrists, and they find themselves unable to move the arms, and particularly to perform those motions that depend upon the wrist. This is the slightest degree of palsy, but it is often more severe, and the sick cannot move either the arms, hands, or fingers. The palsy is most commonly confined to the upper extremities, though there are numerous examples of the lower being affected also: there are not indeed wanting instances of an almost total palsy, which followed some colics of unusual violence, and long duration. The sick lay on their back without motion in their legs or arms, with little or no power over the muscles of the neck and head, with a voice no louder than a whisper, and in two cases to these symptoms was superadded almost a total loss of sight, and hearing. Their recovery from such a situation is always extremely slow, and often incomplete; yet there were few to whom the disease proved fatal; for of several hundreds that were ill not more than four or five died, and those were not in the paralytic stage of the disease, but in the convulsions and fits produced by the colic. Yet, though few died, many were lost to the service; for some never recovered the use of their wrists at all, and many more never acquired any strength either in their wrists or arms, and became of course unfit for soldiers."

Any influence of Franklin upon Tanquerel des Planches is uncertain, but by 64 years, Franklin preceded Tanquerel at La Charité Hospital in Paris. This was 42 years before Tanquerel was born (1809-1862). The circumstances are these: In 1767 (the year of Baker's Devonshire report), Franklin journeyed to Paris from London with his intimate friend, Sir John Pringle. Dr. Pringle visited La Charité and brought away a listing of patients who had been hospitalized there for that condition now known to be lead poisoning, but not then so recognized. Franklin analyzed these hospital records as to occupations. All save two groupings clearly had been exposed to lead. Unsatisfied, Franklin sought out one or more of the hospital staff and acquired additional information linking the patients with lead exposure. Franklin identified the malady as related to occupation and to lead as the common exposure.

Tanquerel's investigations began in 1831. His monumental publication appeared in 1838. He recorded familiarity with Baker's work, but is not known to have mentioned Franklin or to have been aware of Franklin's observations in the

locus of Tanquerel's work at La Charité. The list of La Charité patients mentioned by Franklin was known to Tanquerel. In 1838 he wrote, "the work of Stockhausen (the physician at the lead mines of Goslar, Germany, and credited by Tanquerel as being the father of the true history of lead colic) was translated into French about this time accompanied by judicious notes by Gardane, who also published, in 1768 (one year after Franklin's visit) in French, 'Recherches sur la Colique metallique' containing a succinct account of the works of the ancients on this disease. Gardane's tract contains a list of the patients affected with lead colic who entered the hospital of La Charité from 1755 to 1767."

It is conclusive that Franklin antedated Tanquerel by 64 years in the acceptance that the disease, for the treatment of which La Charité was famous, was lead poisoning and significantly of occupational origin.

After Tanquerel came the German publication of Rumpelt in 1845. It is perhaps more than a coincidence that the translation into English respectively of Rumpelt and Tanquerel reveals striking language resemblance. If truly Rumpelt leaned too heavily upon Tanquerel, all unknowingly the thread of Franklin continued. In all this the exility becomes gossamer.

The Core Items

TO ESCAPE any charge of undue speculation, it becomes desirable to include some known originals. Already a number of short documentary quotations have been inserted. This section is reserved for the fundamental materials, the core of evidence that has led to the over-all conclusion that Franklin widely participated in the European revival of learning about lead poisoning.

Massachusetts-Bay Law

"AN ACT FOR PREVENTING ABUSES IN DISTILLING OF RUM AND OTHER STRONG LIQUORS, WITH LEADEN HEADS OR PIPES.

"Whereas the strong liquors and spirits that are distill(e)d through leaden heads or pipes are judged on good grounds to be unwholesome and hurtful; notwithstanding which some persons to save charge may be led into the making or using of such heads, worms or pipes; for remedy and prevention whereof,—

"Be it enacted by the Lieut. Governour, Council and Representatives of Gen'l Court assembled, and by the authority of the same,

"(Sect. 1) That no person whatsoever shall make use of any such leaden heads or worms, for the future, and that whosoever shall presume to distil, or draw off any spirits or strong liquors thro' such leaden heads or worms; upon legal conviction thereof before any of his majesties courts of records, shall forfeit and pay a fine of one hundred pounds.

"And be it further enacted by the authority aforesaid,

"(Sect. 2) That no brazier, pewterer or other artifcer whatsoever, shall presume to make any worm or head, for distilling, of coarse and base pewter, or such as hath any mixture of lead in it under the penalty of one hundred pounds.

"And be it further enacted,

"(Sect. 3) That in each town within this province where the distilling trade is carried on, it may be lawful for the inhabitants thereof, at the annual town meeting in March for choice of town officers to choose two or more assay-masters, whose business it shall be to inspect and make trial of any such heads and worms as shall be suspected by them; and if, upon the assaying and trial of them, they be found to be made of lead or of other base mettal, or to have an alloy of lead or of other base mettal in them, they shall give notice thereof to the distiller or owner thereof, who is hereby forbidden to make any further use thereof in distilling, under the aforesaid penalty of one hundred pounds.

"And be it further enacted by the authority aforesaid,

"(Sect. 4) That the assay-masters or inspectors are hereby impowered to enter into any still-house or place where such utensils are suspected to be kept and to cut off so much of them as shall be needful to make an assay or trial of them. And every distiller shall be obliged to produce a certificate under the hands of the assay-masters for the time being, for on their pewter heads and worms which they shall make use of in distilling, that they have been tryed and are approved of by them for good pewter, and that they put their mark and number upon them, for which mark a stamp shall be forthwith prepared at the town charge; for which certificate, and every assay made by them they shall be allowed by the distiller or owner of such heads and worms, the sum of five shillings; the said certificate, with mark and number to be entered in the town clerk's book for which service the town clerk shall be allowed sixpence.

"And be it further enacted by the authority aforesaid,

"(Sect. 5) That all forfeitures and penalties arising by vertue of this act shall be the one-half to the poor of the town where the offence is committeed, and the other half to him or them that shall inform and sue for the same.

"And further,

"(Sect. 6) That Capt. Thomas Smith, Mr. Jonathan Jackson and Mr. Jonas Clark of Boston be the first and present assay-masters for the towns of Boston and Charlestown, and that they and all others hereafter chosen to that office shall make oath as follows; viz.,—

"'I, A.B., do solemnly swear that I will, to the best of my skill, prove and make trial of all worms and still-heads within the town of C., that are used or designed to be made use of in distillery, that shall come to my knowledge, for which there is no certificate in that town clerk's book, and will make a true and faithful report thereof to the town clerk for the time being. So help me God.'

"Passed and published September 3, 1723."

This early law, which indeed was one of the first related to an occupational disease, provokes two comments:

Throughout the history of occupational diseases, almost every advance directly has been related to economics. In this instance, the outstanding concern was not for the poor, unfortunate victims in North Carolina whose plight provoked the protest; instead it may be conjectured there was stern agitation lest New

England lose its market for rum. If the product was to enjoy acceptance, the product must be good—hence the law.

The second comment relates to the mystery as to who was so well informed medically as to have guided the Massachusetts legislators. Ineluctably this was not Franklin. At that time he was a near-boy bent on breaking his apprenticeship bonds and certainly unskilled in lead poisoning.

This milestone in occupational health has been well presented in the *Journal of Industrial Medicine and Surgery*, 10:12:532 (December) 1941, by Whittaker together with other items revealing Franklin's familiarity with lead poisoning. Whittaker was aware that the flow of facts as to lead poisoning was from the West to the East and thus contrary to the customary importation of medical guidance from Europe.

The Benjamin Vaughan Letter

IN ENGLAND one of Franklin's non-medical intimates was the secretary to Lord Shelburne, Mr. Benjamin Vaughan. This gentleman was a native of the West-Indies who, throughout Franklin's turbulent years in England, was Franklin's staunch supporter.

"To Benjamin Vaughan

"Philadelphia July 31, 1786.

"Dear Friend

"I recollect that, when I had the great Pleasure of seeing you at Southampton, now a 12 month since, we had some Conversation on the bad Effects of Lead taken inwardly; and that at your Request I promis'd to send you in writing a particular account of several Facts I there mentioned to you, of which you thought some good use might be made. I now sit down to fulfill that Promise.

"The First Thing I remember of this kind was a general Discourse in Boston, when I was a Boy, of a Complaint from North Carolina against New England Rum, that it poisn'd their People, giving them the Dry Bellyach, with Loss of the Use of their Limbs. The Distilleries being examin'd on the occasion, it was found that several of them used Leaden Still-heads and Worms, and the Physicians were of Opinion, that the Mischief was occasioned by the Use of Lead. The Legislature of the Massachusetts thereupon pass'd an Act, prohibiting under severe Penalties the Use of such Still-heads and Worms thereafter. Inclos'd I send you a Copy of the Acct. taken from my printed Law-Book.

"In 1724, being in London, I went to work in the Printing-House of Mr. Palmer, Bartholomew Close, as a Compositor. I there found a Practice, I had never seen before, of drying a Case of Types (which are wet in Distribution) by placing it sloping before the fire. I found this had the additional Advantage, when the Types were not only dry'd but heated, of being comfortable to the Hands working over them in cold weather. I therefore sometimes heated my case when the Types did not want drying. But an old Workman, observing it, advis'd me not to do so, telling me I might lose the use of my Hands by it, as two of our Companions had nearly done, one of whom that us'd to earn his Guinea a Week, could not then make more than ten shillings, and the other, who had the Dangles, but seven and six-pence. This, with a kind of obscure Pain, that I had sometimes felt, as it were in the Bones of my Hand when working over the Types made very hot, induced me to omit the Practice. But talking afterwards with Mr. James, a Letter-Founder in the same Close, and asking him if his People, who work'd over the little furnaces of melted Metal, were not subject to that Disorder, he made light of any danger from the Effluvia, but ascribed it to the Particles of the Metal swallow'd with their Food by slovenly Workmen, who went to their Meals after handling the Metal, without well washing their Fingers, so that some of the metalline Particles were taken off by their Bread and eaten with it. This appeared to have some Reason in it. But the Pain I had experienc'd made me still afraid of those Effluvia.

"Being in Derbishire at some of the furnaces for smelting of Lead Ore, I was told, that the Smoke of the Furnaces was pernicious to the neighboring Grass and other Vegetables; but I do not recollect to have heard anything of the Effect of such Vegetables eaten by Animals. It may be well to make the Enquiry.

"In America I have often observ'd that on the Roofs of our shingled Houses, where Moss is apt to grow in northern Exposures, if there be anything on the Roof painted with white Lead, such as Balusters, or Frames of dormant Windows, &c., there is constantly a streak on the Shingles from such Paint down to the Eaves, on which no Moss will grow, but the wood remains, constantly clean and free from it. We seldom drink RainWater that falls on our Houses; and if we did perhaps the small quantity of Lead descending from such Paint might, not be sufficient to produce any sensible ill Effects on our Bodies. But I have, been told of a case in Europe, I forgot the Place, where a whole Family was afflicted with what we call Dry Bellyach, or Colica Pictonum, by drinking RainWater. It was at a Country-Seat, which being situated too high to have the Advantage of a Well, was supply'd with Water from a Tank, which received the Water from the leaded Roofs. This had been drunk several Years without Mischief; but some young Trees planted near the House growing up above the Roof, and shedding their Leaves upon it, it was suppos'd that an Acid in those Leaves had corroded the Lead they cover'd and furnished the Water of that with its baneful Particles and Qualities.

"When I was in Paris with Sir John Pringle in 1767, he visited La Charité, a Hospital particularly famous for the Cure of that Malady, and brought from thence a Pamphlet containing a List of the Names of Persons, specifying their Professions or Trades, who had been cured there. I had the curiosity to examine that List, and found that all the Patients were of Trades, that, some way or other, use or work in Lead, such as Plumbers, Glaziers, Painters, &c., excepting only two kinds, Stonecutters and Soldiers. These I could not reconcile to my Notion, that Lead was the cause of that Disorder. But on my mentioning this Difficulty to a Physician of that Hospital, he inform'd me that the Stonecutters are continually using melted Lead to fix the Ends of Iron Balustrades in Stones; and that the Soldiers had been employ'd by Painters, as Labourers, in Grinding of Colours.

"This, my dear Friend, is all I can at present recollect on the Subject. You will see by it, that the Opinion of this mischievous Effect from Lead is at

least above Sixty Years old; and you will observe with Concern how long a useful Truth may be known and exist, before it is generally receiv'd and practis'd on.

"I am, ever, yours most affectionately,
"B. Franklin"

The Cadwalader Evans Letter

"TO CADWALADER EVANS
"Dear Sir "London, February 20, 1768

"In yours of November 20th, you mention the lead in the worms of stills as a probable cause of the dry belly-ach among punch-drinkers in our West-Indies. I had before acquainted Dr. Baker with a fact of that kind, the general mischief done by the use of lead worms, where rum-distilling was first practiced in New England, which occasioned a severe law there against them, and he has mentioned it in the second part of his piece not yet published. I have long been of opinion, that distemper proceeds always from a metallic cause only; observing that it affects, among trades-men, those that use lead, however different their trades,—as glaziers, letter founders, plumbers, potters, white-lead makers and painters; (from the latter, it has been conjectured, it took its name Colica Pictonum, by the mistake of a letter, and not from its being the disease of Poitou) and, although the worms of stills ought to be of pure tin, they are often made of pewter, which has a great mixture in it of lead . . . ."

This brief letter adds nothing new as to lead poisoning, but serves to reflect Franklin's method of registering opinions. Through thousands of items of correspondence, Franklin disseminated his information and his beliefs. It is well known to the antiquarian that extensive correspondence by Franklin is stored in various places little touched by the historian. Undoubtedly this reservoir embraces additional papers on lead poisoning, the existence of which has been mentioned widely but exact contents not yet revealed.

Cadwalader's "Dry-Gripes"

A SINGLE quotation is extracted from this essay and chiefly for the purpose of registering the violence of the disorder.

"The European Phyficians give an Account of a Difeafe fimilar to the Dry-Gripes, calling it Cholica Pictonum, becaufe moft frequent at Poictiers. They are both attended with exceffive griping Pains in the Pit of the Stomach and Bowels, which are much diftened with Wind; violent and frequent Reachings to vomit, fometimes bringing up fmall Quantities of bilious Matter; at other times there is a Senfation, as if the Bowels were drawn together by Ropes; great Coftivenefs, and frequently a continual Inclination to go to Stool without voiding any Thing.

"The Ducts which open into the Inteftines, and excern a Mucus to moiften and lubricate them, are obftructed and glewed up with a Vifcofity not eafily refolvable; and through the whole Courfe of the Diftemper, the Faeces are extremely dry and hard, in fmall Lumps like Bullets. The Inteftines are drawn up towards the Back with almoft continual convulfive Twitches. The Pains are frequently fo fharp, that the Patient will fall on the Floor, and cry out violently in the greateft Agony."

TANQUEREL DES PLANCHES has been styled "The Columbus of Lead Poisoning." Let that appellation remain. He deserves it. But, before Tanquerel stood Benjamin Franklin. It is proper to style him "the great catalyzer of the revival in awareness of lead poisoning."

Too Much Concern

IT IS EASY to agree that nothing is basically wrong with the American worker. We all see evidence of respect for the dignity of work, but we also see evidence of the opposite trend. We should stand back and see if we have gone too far in a decade of manpower shortage to unbalance the worker-job relationship. Examples are of record where very able work groups have lost productivity and enjoyment of their own work because of unwitting supervision resulting from excessive emphasis on the human element. Supervisors, seeking to put into practice training they have received, have helped their subordinates to become excessively self-conscious. Such self-consciousness often results in employees becoming over-sensitive, constantly thinking in terms of how they are being treated, and how every action is going to affect them. They may lose sight of job responsibilities. They become over-critical of their superiors, touchy, and defensive. It is submitted that such situations are largely caused by work and the job being crowded into the background by untoward concern with the individual.

—From "The Job's the Thing," by GEORGE H. HIERONYMUS, in *Personnel Administration*, July, 1953.

Prosthetic Replacement of the Metacarpal Head

W. RUSSELL MACAUSLAND, M.D.
Surgeon-in-Chief of the Orthopedic Section, Carney Hospital
Boston, Massachusetts

PROSTHETIC reconstruction is being used with increasing frequency as a method of treatment for painful and mechanically defective joints, especially the faulty hip joint. The case reported below is, to the writer's knowledge, the first to be recorded in which a prosthesis was utilized in the reconstruction of a disorganized metacarpophalangeal joint.

Case Report

A 28 YEAR old mechanic was first seen on November 5, 1951, complaining of pain in the knuckle of the second finger of the right hand, weakness of the involved finger, and inability to grasp objects. These symptoms had persisted over a period of 10 months, following an injury sustained when he had dropped a keg of acid weighing 150 pounds. He had not been able to return to work.

At the time of the accident, the injury had been diagnosed by the attending physician as a fracture of the distal end of the metacarpal bone. An attempt had been made to reduce the fracture, and a splint applied. Later, a plaster cast was worn for a few weeks and physiotherapy carried out over a period of several months.

Examination disclosed a slight prominence over the knuckle and a protuberance on its palmar surface. An x-ray showed a malunited fracture of the distal end of the metacarpal bone (Fig. 1). This fracture was of the crushing communited type which is commonly observed in a prizefighter's finger as the result of a blow received on the knuckles.

In view of the questionable value of the two methods at our disposal for treating a malunited fracture of this type—resection and arthroplasty—prosthetic reconstruction was suggested. The condition of both the musculotendinous apparatus and surrounding tissues was favorable; the extensor and flexor tendons were intact, and the interossei active. There was no nerve defect.

The operative details were as follows: The metacarpophalangeal joint was approached through a dorsolateral incision on the radial side of the extensor digitorum communis, above the dorsal indicis artery and the dorsal digital branch of the radial nerve. Upon exposure of the fracture site, two fragments of the metacarpal head were found to be displaced posteriorly and laterally, and union with the shaft had taken place in approximately 80° of deformity. In addition, the articular cartilage had glided posteriorly, like a cap, over the metacarpal end.

The joint surfaces were separated. The distal end of the metacarpal head was excised transversely by means of an electric saw, approximately ⅝-inch of bone being removed. A small channel was drilled in the center of the metacarpal shaft to receive the stem of the prosthesis.

An artificial metacarpal head, fabricated of nylon and fashioned slightly smaller in size than the normal second metacarpal head, was inserted. The capsule and subcutaneous tissues were closed in a single layer, and the skin was closed with interrupted sutures of silk. A dressing was applied (Fig. 2).

The finger was maintained in the position of approximately full extension for a period of 10 days. Upon the removal of the dressing, gentle passive movements were begun, and the patient was encouraged to exercise the finger by squeezing a soft rubber ball. Physiotherapy was carried out for several weeks.

Within a few days after the removal of the dressing, the finger had a good range of motion in flexion and was well controlled. Five weeks

Fig. 1. Fig. 2.

Fig. 1: Malunited fracture of the distal end of the metacarpal bone of the crushing, comminuted type with tilting of the distal fragments volarward and displacement posteriorly and laterally. (By permission of Am. J. Surg.)

Fig. 2: Postoperative x-rays, showing prosthesis in place. (By permission of Am. J. Surg.)

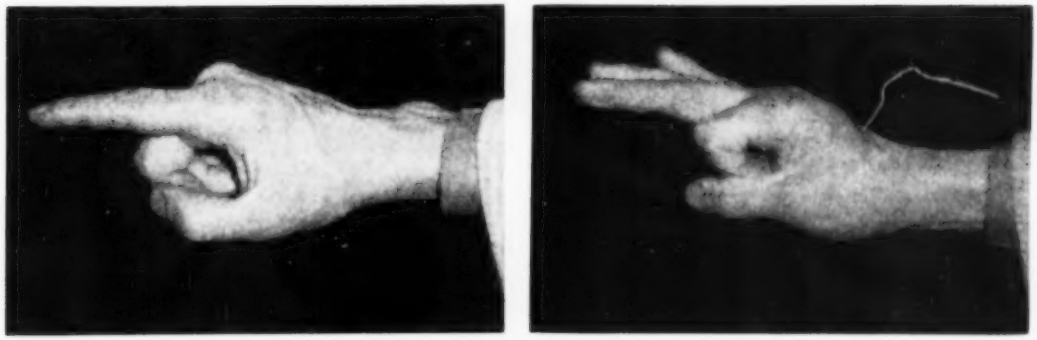


Fig. 3.
Photographs taken eight weeks after prosthetic reconstruction, showing normal range of motion in extension and flexion. The joint is painless and well controlled. (By permission of Am. J. Surg.)

later the patient requested permission to return to work. The joint was stable and painless, and the range of motion in both extension and flexion was normal (Fig. 3). The gripping power of the hand had been recovered. At the present time, a year and nine months after the operation, the finger continues to be painless, stable and functional. The patient writes that he is in construction work and his finger is as "good as new."

Comment

A MALUNITED fracture of the distal end of the metacarpal bone is far from being a negligible infirmity and may cause serious disability if a person must use his hands in working. Incapacity is limited not merely to a restriction of the flexor movement of the finger; the joint is painful, the digit weak, and the gripping power of the hand diminished. In some cases the joint is completely ankylosed.

The "squash" type of fracture of the distal end of the metacarpal bone is caused by a blow received directly on the knuckle. The deformity is typical, the distal fragment or fragments being impacted on the metacarpal shaft with dorsal angulation and tilted downward into the palm. Sometimes the fragments are displaced laterally. The articular surface itself can hardly escape being damaged. Joint mechanics are entirely disrupted by the alteration in the contour of the metacarpal end.

Malunion in some cases is due to lack of proper attention to the treatment of an injury at this site. More often, the fracture is not precisely reduced, or the finger properly positioned, largely because of the failure to understand the working of the musculotendinous structure of the joint. Owing to the difficulty of maintaining reposition following reduction and, at the same time, preventing restriction of finger motions, the corrected position may be lost through too early mobilization. This danger may be obviated by using one of the several immobilizing methods which permit free use following fixation of the fragments.

Surgical treatment of these malunited fractures previously has been limited to the methods of resection and arthroplasty. Little mention of the use of the resection method in the treatment of finger joints is found in the literature. There is always the danger that a joint will be unstable following wide excision. This procedure has produced some satisfactory results in larger joints, but with the passing of time it has been found that the function tended to fail and the joint became painful.

The efficacy of arthroplastic methods in the fingers, comparable in technique to procedures used in larger joints with free fascia as the interposition material, still remains unknown. A compilation of all the finger arthroplasties reported in literature would include less than 150 cases.[1,2,3,4,5,6,7,8,9,10,11,12] A few surgeons, among whom are Liebolt,[7] Pratt,[8] Fowler[2] and Bunnell,[1] consider the metacarpophalangeal joint a favorable site for arthroplasty, since it is not a weight-bearing joint and is well controlled by tendons. On the other hand, the limited number of reports would suggest that arthroplasty of the fingers which, undoubtedly, has been attempted many times in these small, non-weight-bearing joints, has given disappointing results.

The writer found with continued experience that it was difficult to interpose material of any nature into the small articular space of the finger joints and close the capsule satisfactorily. The intervening substance always was bulky and the capsule, if closure were possible, had to be drawn tightly. On the whole, the results were not satisfactory.

The possibilities of solving the difficult problem of the treatment of these malunited fractures, as well as the ankylosed finger, by the substitution of a prosthesis, merit consideration. The operative procedure is a simple one. Proper bone alignment and muscular balance are reestablished. The preservation of the capsular structure aids in providing stability. A prime consideration of the suitability of applying the method is, of course, the integrity of the musculotendinous system and the presence of intact nerves and healthy surrounding tissues.

Summary

A CASE of a malunited fracture of the distal end of the metacarpal bone, in which the metacarpal head was successfully replaced by a prosthesis, has been presented. Five weeks after the replacement operation, the joint was painless, stable and functional, and the patient returned to work.

The seriousness of a malunited fracture at this site, the causes of malunion, and the drawbacks of the other two methods of treatment available —resection and arthroplasty—are discussed.

References

1. BUNNELL, S.: Surgery of the Hand. J. B. Lippincott Co., Philadelphia, 930 pp., 1948.
2. BURMAN, M., and ABRAHAMSON, R. H.: The Use of Plastics in Reconstructive Surgery; Lucite in Arthroplasty. *Mil. Surgeon*, 93:405, 1943.
3. FOWLER, S. B.: Mobilization of Metacarpophalangeal Joints; Arthroplasty and Capsulotomy. *J. Bone & Joint Surg.*, 29:193, 1947.
4. GUILLEMINET, M., ROY, J. C., and ANDRIE, G.: Résultats de l'arthroplastie des articulations digitales. *Rev. orthop., Par.*, 32:277, 1946.
5. HAMILTON, G.: Arthroplasty of the Thumb and Finger Joints. *Texas State J. Med.*, 14:353, 1919.
6. HARDIN, C. A.: Arthroplastic Reconstruction of Metacarpophalangeal Joint, Left Thumb. *M. Bull., Theat. Chief Surgeon, European Theat.* (No. 2), 2:20, 1947.
7. LIEBOLT, F. L.: The Use of Capsulectomy and Arthroplasty for Limitation of Finger Motion. *Surg., Gynec. & Obst.*, 90:103, 1950.
8. MACAUSLAND, A. R., and MACAUSLAND, W. R.: The Mobilization of Ankylosed Joints by Arthroplasty. Lea & Febiger, Philadelphia, 252 pp., 1929.
9. PRATT, D. R.: Joints of the Hand and Fingers—Their Stiffness, Splinting and Surgery. *California Med.*, 66:22, 1947.
10. Report of the Meeting of the South-West Orthopaedic Club held at Bath and Wessex Hospital, Bath, England on September 10, 1949. *J. Bone & Joint Surg.*, 31-B:640, 1949.
11. ROY, J. C.: Contribution à l'étude de l'arthroplastie dans la chirurgie restauratrice des doigts. *Thèse de Lyon*, 1945.
12. STEINDLER, A., and MARXER, J. L.: The Traumatic Deformities and Disabilities of the Upper Extremity. Charles C. Thomas, Springfield, Illinois, 494 pp., 1946.

How? Where? When?

IN MY experience, most of the difficulty concerning a decision as to whether a case is entitled to compensation is due to the fact that the examining physician does not inquire sufficiently into the details of the alleged injury. He does not question the patient sufficiently, or he may not take the trouble to corroborate the story given by the patient. Frequently it is necessary to get additional information from witnesses to the alleged accident because sometimes the patient may not clearly recall what really happened. Likewise, in the examination procedure it is not wise to depend on the absence of symptoms or a lack of outward signs to reassure one that some occult injury has not taken place. If there is a reasonable chance that injury could have occurred because of the "how," "where," and "when" of the alleged injury, I prefer to use diagnostic procedures to insure that the results are negative, even though such procedures may seem to be unnecessary. It has been my experience, as it has undoubtedly been the lot of other industrial physicians, to have some of my decisions questioned by other physicians in the community. To the best of my knowledge, there have been two reasons for this. Either I slipped up and did not follow my own rules, or the physician in the community made a hasty decision that he was dealing with a compensation case without benefit of adequate information as to "how," "where," and "when," or he may have made an inadequate examination of the patient. Situations like this, of course, lead to a great deal of friction in the community between industrial physicians and other physicians and are the commonest causes for contention before industrial boards.

—From "What Constitutes a Compensation Case," by E. H. CARLETON, M.D., in *J. Iowa State Med. Soc.*, August, 1953.

Bernardino Ramazzini

(1633-1714)

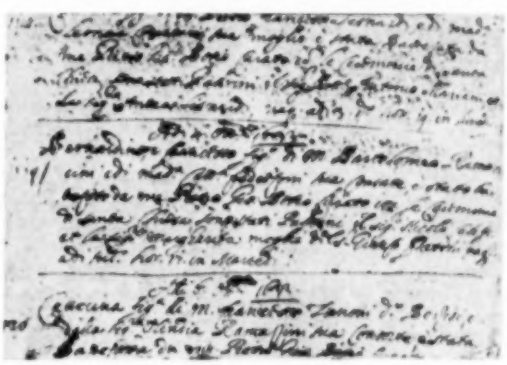
Founder of Occupational Medicine

FORTUNATO M. TRIOSI, M.D.
Bologna, Italy

RAMAZZINI'S life was written in Latin by his nephew, Dr. Bartolomeo Ramazzini, and is the preface to Bernardino's "Opera Omnia" which was published in Geneva in 1716 by Cramer and Parachon. The same edition carried the well known oval picture of Ramazzini etched in copper. Much more about the life, career and writings of Ramazzini is stored in various archives than ever has appeared in print, and notably in English print. This article attempts to introduce some newness and freshness into the Ramazzini story.

We shall dwell first on the physical appearance of the founder of Occupational Medicine. Among the authentic portraits of Ramazzini is the one preserved in the gallery of the Civic Museum in Carpi, his native city, and which was published in *Industrial Medicine and Surgery* (21:7, 349 (July) 1952—Fig. 5). This is of interest from a historical point of view since it was made while he still was alive in 1700 when he went from the University of Modena to the University of Padua. In this picture he appears (as he has been described in his nephew's biography) slender, with crisp black hair, high forehead and with large black eyes which accentuated his grace and charm. His ruddy complexion had an olive cast. Despite a prominence near his right ear, his countenance did not appear deformed. It was said of him that he walked rapidly. He did not tolerate loquacity and expressed himself in few words. He disliked sports and games except chess, in which pastime he sometimes indulged. He dressed simply as became his status as a professor.

Bernardino Ramazzini was the son of Bartolomeo Ramazzini and Caterina Federzoni, who were married November 17, 1631. He was born Tuesday, October 4, 1633, in Carpi and was named Bernardino and Francesco, the former being his grandfather's name and that of the patron saint of Carpi (San Bernardino) and the latter in honor of Saint Francis (San Francesco) whose feast is celebrated on his birth date and who is the second patron saint of the city. In the "Liber Baptizorum" (Baptismal Records) 1625-1640, Volume XVII, in the Archives of the Cathedral of Carpi, entry number 119 reads as follows: "On the fourth day of October 1633—Bernardino e Francesco, son of Bartolomeo Ramazzini and of Caterina Federzoni, his wife, was baptized by me, Pietro Giovanni Bosio, curate, according to the rites of the Holy Church. The godparents were Nicolo' Caleffi and Margherita, wife of Giuseppe Patoni. He was born on the above mentioned date, on Tuesday, at the 17th hour." The 17th hour of the 4th of October, 1633, would be about 11:30 A.M. because the numbering of the hours in Italy in the 17th century, and during a large part of the 18th century, was calculated according to the so-called Italian system, i.e., it began in the evening about one-half hour after sunset, or, more precisely, from the 15th of May to the 1st of August, the 24 hours ended at 9:00 P.M., and then, each half month, a half hour earlier until the 15th of November when they ended at 5:00 P.M. and thus the time remained until the 15th of February, from which day until the 15th of May, the time was set back a half hour each month.



Photograph of Ramazzini's birth record in the book of Baptismal Records of the Cathedral in Carpi. It translates as follows: "On the fourth day of October, 1633, Bernardino e Francesco, son of Bartolomeo Ramazzini and of Caterina Federzoni, his wife, was baptized by me, Pietro Giovanni Bosio, Curate, according to the rites of the holy church. The godparents were Nicolo' Caleffi and Margherita, wife of Giuseppe Patoni. He was born on the above mentioned date, on Tuesday, at the 17th hour."

His family belonged to the intellectual middle class, and according to the social standards of those times was a part of the so-called recent nobility of Carpi, boasting men of culture for only a century. (In a document dated 1567 it is

noted that Ramazzini's great-grandfather was also a physician.) The family had as its coat of arms a black eagle on a gold field and a mailed iron arm with a bundle of brushwood in its fist on a field of blue.

Carpi, where this first doctor of Occupational Medicine was born (and which at the end of the 15th century had already seen the birth of another great physician, Berengarius, of Carpi, famous Anatomist and Traumatologist) was at that time, as now, a modest village of northern Italy in the plain of the Po River, and was a part of the Duchy of Modena. Italy at that time found itself (after the Treaty of Chateau Cambresis in 1559) divided into various states: the Church, the Republic of Venice, and the Kingdom of Piedmont, while under the dominion of Spain were the Kingdom of Naples, Sardinia, and the Duchy of Milan. Other less important states were under the rather formal dependence of the Holy Roman Emperor, among which was the Duchy of Modena, governed by the Este family.

At Carpi, Ramazzini studied Grammar and the Humanities in the local Jesuit College, receiving from them a fundamental classical education according to the custom of the time. This excellent instruction left its indelible mark on all his scientific work. When at 19 he was sent to the University of Parma, he had a strong inclination toward classical studies. Here for the first three years he followed philosophical courses. For the next three years he studied medicine, receiving his degree *"cum signo laudis"* in Medicine and Philosophy on the 21st of February, 1659. (This appears on the Diploma and License to practice Medicine and Surgery received by Ramazzini from the College of Medicine in Modena on October 12, 1768.)

After receiving his degree he went to Rome for further studies in Practical Medicine. He remained in Rome from 1659 to 1663. He had as an instructor, A. M. Rossi, Professor at the University called "La Sapienza."

In 1663 he entered professional practice as the community doctor in the two small towns of Canino and Marta of the province of Rome. Here he acquired prestige and great esteem among the population of the towns and outlying areas. However, because of fatiguing work—work to which he was not adapted not having been endowed by nature with a strong constitution—and having been struck with obstinate malaria, he decided to return to his native Carpi.

In Carpi, having regained his health, he again turned to the practice of medicine which he pursued with ever increasing success. Besides his work and his study of medical treatises he found his greatest pleasure and recreation in reading the Greek and Latin poets and in writing poems, for which he had a singular natural bent. In addition he wrote philosophical dissertations which he gave at the local "Academia letteraria degli Apparenti." These academies were numerous in the small towns of Italy from the beginning of the Renaissance. They gathered together those who devoted themselves to studies. Ramazzini was enrolled as a member on the 13th of January, 1668, and was nominated censor on the 17th of January, 1669. According to the memoirs of the Academy, the following question was proposed on January 30, 1669: "Which is the worst punishment, Pestilence, War or Famine?" Ramazzini read a learned dissertation in which he gave preference to Pestilence.

The University of Modena (Saint Charles College) at the time when Ramazzini taught there, as it appears from a contemporary painting, (at the end of the 17th Century).

At the meeting of February 5, 1670, upon the insistence of the President who had been recently married, Ramazzini read a dissertation in which he undertook to demonstrate that it is more convenient for a man to attend with profit to his studies in the married than in the single state.

At the meeting of the 31st of March, 1675, the topic for the discussion was: "To which of the three classes of nobility, as decreed by Aristotle, is due the precedence in order to immortalize oneself." With strong and brilliant oration, Ramazzini maintained that it would have to be the nobility of nature. Over and above these dissertations he often recited his own poetic compositions in both Italian and Latin.

At Carpi, on the 13th of February, 1665, at the age of 32, he was married to Francesca Righi of Carpi. From this marriage were born two male children, who died in infancy, and two daughters, each of whom in due time married a doctor of Modena.

In the meantime, Ramazzini formed friendships with many Modenese who came to the fertile regions of Carpi to spend their summer vacations on their country estates. These men, cognizant of his intelligence, professional value, his pleasant, courteous manner and good nature, induced him to transfer himself to Modena where he established residence in 1671 when he was 38 years old.

At Modena he quickly acquired the esteem of the people and that of the governor of the state, Duke Francesco II d'Este, and became one of the

The University of Parma at the time when Ramazzini studied there (1652-1658), as it appears from a contemporary drawing.

most renowned and sought after doctors of the city. From the beginning, as often happens in professional practice, he found himself poorly received by some of the older doctors. The latter, confused by his new ideas and befuddled by his skill, caused Ramazzini to sustain many lively polemics. An example of these disputes appears in an article printed in 1678 about a controversy with Dr. Annibale Cervi concerning a case of empyema in a woman patient. It was not recognized by the attending physician, Cervi, but was diagnosed by Ramazzini who proposed a thoracectomy. Other polemics, published in 1681 and 1682, were occasioned by the death of a young wife having her first child. A Marchioness, she had married into one of the first families of Modena, and came from one of the principal families of Florence. Ramazzini, who with two renowned doctors had assisted at the birth, was asked by the family of the deceased to write a report of the case. The report was communicated to the physician of the Grand Duke of Tuscany in Florence who wrote a bitter criticism on the conduct of Ramazzini and the other doctors, accusing them of not extracting the placenta manually. This criticism was consigned into Ramazzini's own hands. He was forced to defend himself, and published his report in Modena in 1681. This report gave rise to a heated controversy that threw the medical world at that time into an uproar. There are three responses by Ramazzini, published 1681-1682, which even drew the attention of the legal profession.

In defense of Ramazzini were printed two legal discourses, one in 1682 and the other in 1683. Among the correspondence of Marcello Malpighi (Professor at the University of Bologna) in the Archives of the State in Modena is a letter from the physician of the Grand Duke of Tuscany who, annoyed at the prolonging of the polemic, wrote invoking Malpighi's protection against Ramazzini. Malpighi, not only a great scientist but a just and broad-minded man, had great esteem for Ramazzini. He interested himself in the controversy objectively, calmly, and insofar as it seemed to merit attention from a scientific point of view. When the dispute was excessively prolonged and deviated into the field of personal attack, he wrote to the physician of the Duke of Modena, a friend of his and of Ramazzini's, saying: "I think that this comedy should come to an end, seeing as the doctrinal material is reduced to such a point that only repetitions result." As a result of repeated and always more bitter aggressions of the doctor of Florence, Ramazzini answered in a different tone but with great energy and efficacy so that in the end the former had to turn to the Grand Ducal Court of Tuscany, which by means of the Roman Court evoked the intervention of the Duke of Modena, who begged Ramazzini to stop further publications.

Meanwhile plans were made to reconstruct the University of Modena which had been founded in the 12th century for the teaching of Law and afterwards had declined, owing to the proximity of the University of Bologna. In 1678, courses in Philosophy, Mathematics and Civil Law were founded again, and in 1682 the teaching of Medicine was begun. By unanimous consent, Ramazzini was called to fill the Chair of Medicine. In December of that year, in the presence of the Reigning Prince and men of learning gathered together for the occasion, he delivered the inaugural address, "In solemni Mutinensis Academiae instauratione" (Upon the solemn inauguration of the University of Modena).

The teaching post in Medicine was held by Ramazzini alone until 1685 when, at his request, he was given as a colleague a renowned doctor of Modena, Francesco Torti. Torti taught clinical medicine; Ramazzini taught theoretical medicine. The association continued for 15 years until 1700.

In the Archives of State in Modena are preserved some notices of the opening of the scholastic years, written in Latin, with the schedule of studies and a list of instructors. The name of Ramazzini appears for the academic year 1682-1683 as teaching Institutiones Medicinales (Medical Institutions) and Lectiones in Aphorismos Hyppocratis (Lessons on the Aphorisms of Hippocrates). From 1685 to 1690, the particular teaching posts for Ramazzini were as follows:

The ancient courtyard of The University of Padua, around which are the classrooms where Ramazzini taught (constructed in the second part of the 16th Century).

1685—Tractatus de Febribus (Treatise of Fevers).

1686—Institutiones Medicinales (Medical Institutions).

1688—In Librum Hyppocratis De Glandulis (On the book of Hippocrates concerning Glands).

1689—Aphorismos Hyppocratis (Aphorisms of Hippocrates).

1690—De Morbis Artificum (On the diseases of workers).

At the University of Padua, which was one of the best of that epoch, the professors of Medicine were much more numerous: four full professors, four associate professors, or "in secundo loco," and in addition, the assistant professors. Therefore the teaching had a more constant character. From the Department of Theoretical Medicine, systematically commentating, were taught the Aphorisms of Hippocrates, the first Fen of Avicenna, and the Ars Medendi Galeni (The Art of Curing by Galen) also called the Little Art of Galen.

Ramazzini and his colleague naturally became the particular doctors of the reigning Duke, Francesco II d'Este. One reads in the manuscripts of the Archives of State in Modena that these two doctors received a monthly stipend of two "Doppie," and had the duty to "go alternately to the Duke's palace an hour or so each evening to feel his pulse, to converse, to discuss virtuous readings, and to comment on literary writings." When the Duke died in 1694, he acknowledged the labors of these two doctors during his infirmity by ordering in his last will and testament that "to each one be given immediately 100 Doppie."

The Academy of Modena, called the "Dissonanti," made him a member. Almost every month, in the presence of the Duke, the Academicians, the professors and the courtiers, he held dissertations on some scientific subject or philosophic matter, or he would read verses in Italian or Latin.

Ramazzini had taught at the University of Modena for 18 years (1682-1700) when he was called to the University of Padua where he remained until his death in 1714.

In all his scientific work, one can perceive his characteristic imprint. One notes the observant physician aware of clinical facts; the biologist; and, above all, the hygienist. Principally one sees his high moral character, his upright, humane and rigid temperament which marked all his work as a medical man and as a scientist. His difficult period of service in the province of Rome in no small measure influenced and molded his later life. It was during that period he was able to learn firsthand the miseries and needs of the people, the vices and shortcomings of society; to perceive the necessity of interceding in favor of the downtrodden, forgotten by all; to think of useful and necessary remedies, both from a social and an individual point of view. In reading "De Morbis Artificum" attention is drawn to the fact that the first chapters deal with laborers, the following chapters with artisans, farmers, etc. He treats, above all, of the illnesses of the most humble. Undoubtedly this category was at that time the one in greatest need of science to ameliorate living conditions, to remove sufferings, privations, and troubles anent to work, and to avoid causes of early death and chronic diseases.

Among the works published during the Modenese period, three principally are memorable because they pertain to hygiene. The "Ephemerides Barometricae Mutinenses" (Weekly Barometrical Data of the Modenese Region), published in 1695, in which Ramazzini expounded the data of systematic readings of daily barometric variations for the entire year 1694, noting the conditions of the weather, atmospheric precipitation, humidity, winds, etc. He also speaks of the feeling of pressure in the head and the general ill feeling which some people experience as the result of southern winds, and he interprets it as the result of a slight circulatory disturbance. Mountain sickness he attributes to disturbances of pulmonary circulation provoked by minor pressures of air at great heights. The Ephemerides Barometricae received favorable comment in the medical publications and were reproduced in the "Acta Naturae Curiosorum" (The Acts of the Curiosities of Nature) of the Academy Cesarean-Leopoldine of the Curious of Nature in Vienna.

The "Constitutiones Epidemicae Mutinenses" (Epidemic Characteristics of the Modenese) received still more favorable comment. Published in 1690, 1692 and 1695, atmospheric changes were described for each year from 1690 to 1694, giving an exact account of the infectious diseases which dominated man as well as domestic animals in Modena and the surrounding territory. Parasitic diseases, which at that time damaged the harvests, were treated extensively. Ramazzini discussed the influence these could have in explaining the progression of epidemics and epizo-

otics in the locality. The Constitutiones Epidemicae acquired for Ramazzini fame as an epidemiologist because of the wealth of directing ideas, acumen of observations and the importance of the illustrated facts. It inspired a long series of similar works both in and out of Italy. In the splendid Remondini edition of the works of Thomas Sydenham, published in 1762 in Venice, the Constitutiones Epidemicae of Ramazzini appeared, followed by 50 others of every country in Europe. Successively others were published. The Constitutiones published in 1692 was dedicated to Wilhelm Gottfried Leibnitz. As soon as the first of these Constitutiones Epidemicae was published, Ramazzini received the praises of the most learned doctors of Europe. The Academy Cesarean-Leopoldine of the Curious of Nature in Vienna wanted him enrolled as one of their members with the glorious name of "Third Hippocrates."

But the work that increased Ramazzini's fame as a hygienist is the masterly monograph on the mineral wells in the Modenese region. "De fontium mutinensium admiranda scaturignine" (Concerning the marvelous spring of the Modenese fountain) was published in 1691 and was translated into English by Robert Saint Clair in London in 1697. In this work Ramazzini described the superficial contours of the Modenese region and its geological structure. He indicated the stratified disposition and underground layers of water and of the deep layers nourishing salient wells. He searched the origins, the directions, the limits, the levelling, the range of some variation of water land. He described minutely the ingenious techniques of well construction, and the means employed to impede the pollution by superficial water. He instituted experimental hydrodynamics on influencing resistance on the flow of the fluids in pressure. In discussing the hygienic qualities of the water he showed that he knew the protecting action of the argilliferous strata and also knew some of the facts leading to the pollution of water in wells. He reported a series of observations made on the depth of the soil at diverse depths up to 80 feet, the first such reports made in Europe.

In a publication printed in Modena in 1698, "De Olea Montis Zibinii seu petroleo agri mutinensis" (About the oil of Mount Zibino or the petroleum of the Modenese area), he wrote of research in the petroleum wells in the Modenese region. He had himself lowered into these wells better to understand the dangers to which the workers were exposed. He formulated rules for the prevention of accidents to the workers, and told of his experiments in studying the reaction of petroleum on worms and the therapeutic results thereof.

Previously some studies had appeared on a few illnesses related to labor, such as those gathered by the great anatomist Gabriele Fallopia (1523-1562) on the diseases of miners of mercury; the observations made by Bernardo Cesi on the diseases of those condemned to the mines; and the excellent monograph by the celebrated Neapolitan Luca Porzio published in 1685 on the health of soldiers in camps. (Porzio was then the military doctor assigned to the imperial armies.) However, the first systematic treatment comprising a great number of professions and observations gathered from data permitting qualification of the relation between work and health of workers was Ramazzini's "De Morbis Artificum Diatriba" (Dissertation on the diseases of workers) printed in Modena by Anthony Capponi in 1700. This was the result of 18 years of research and meditation during his university life in Modena. The work was thoroughly thought out, written with rare mastery, and was perfect in concept and form, content and distribution. It included 52 professions, not excluding those of the military and of the intellectuals. The factors deleterious to the health of the workers in each profession, and the means of prevention and of cure were discussed.

The house in Padua, in the street G. B. Belzoni N. 25, where Ramazzini lived, according to the information given by him in a letter to his nephew in Modena, in order to locate him. The portico is characteristic of the epoch. In the same street is the Church of Blessed Helen Enselmini, where he was buried.

In 1700 Ramazzini, at the age of 68, had reached the height of his fame as a scientist and as a teacher. He was called by the Venetian Republic to hold the second chair of "Medicina Pratica Ordinaria" at the Archiginnasio in Padua. This chair corresponded somewhat to that of Pathology and Clinical Medicine in our times. The titular, or first chair, was held by Francesco Spoleti, more in name than in fact. A lover of travel and adventurous life, Spoleti was much absent. He went to England as the physician to the Venetian Legation where he remained for a long time, and then he was sent by the Venetian Senate to Constantinople as Physician to the Legation there. Having been called by the Sultan to cure him, Spoleti acquired his confidence to such an extent the Sultan would not permit him to leave for approximately 10 years. He finally returned to his native land in 1709 because of ill

health resulting from a fall from a spirited horse given him by the Sultan. This fall almost caused him the loss of his sight. In that year, 1709, Spoleti, on his return from Constantinople, asked and obtained from the Senate his release from the first chair of "Medicina Pratica Ordinaria" because of ill health. This chair was then entrusted to Ramazzini.

In the published bulletins for the schedules of classes for the medical faculty at Padua during the period 1700 to 1714 are the names of the famous professors who held the eight principal chairs. With Ramazzini were Domenico Guglielmini, famous physician, biologist and founder of fluvial hydraulics; Antonio Vallianieri, foremost naturalist; and Giambatista Morgagni. These bulletins are printed in Latin, and in them the teachings of Ramazzini are indicated thusly: "Ad praticam ordinarian Medicinae in primo loco. Exc. Dominus Bernadinus Ramacini Mutensis Hora prima pomeridiana—legit; De Morbis particularibus a capite usque ad cor." In the following year with the same indication "legit; De morbis particularibus a corde infra"; in a third: "legit; De febribus"; i.e., "In the titular chair of Practical Medicine, the first professor Bernardino Ramazzini, of Modena, holds class at one o'clock P.M. He treats of the special maladies from the head to the heart; in another year he treats of special maladies from the heart down; and in a third year he treats of fever."

In the preceding year, 1708, the Venetian Senate deliberated the nomination of Ramazzini as "endowed by the most desired requisites of virtue and of prudence," President of the Faculty of Medicine, and in the deliberation one finds that his annual stipend was increased 750 florins of lire 6, that is 4500 lires, annually. Considering that the annual stipend of 4500 lires was appreciably increased by examination and degree fees as well as other emoluments from the Medical College and that the cost of the principal commodities was then, in Padua, of the following level, e.g.: 1 Kg of veal—25 parts of a lira; 1 Kg of beef—20 parts of a lira; 1 Kg of lamb —14 parts of a lira; one chicken—18 parts of a lira; about two cubic meters of firewood—10 lire and that the professors of the University of Padua were exempted from the customary taxes of the town, it must be realized that the treatment the Venetian Republic accorded Ramazzini was decorous and attested still more to the wisdom of the government which assured itself 14 centuries of existence.

Already in 1703 Ramazzini's health had begun to deteriorate. During the summer of 1703, being on vacation at Modena, he was smitten by a troublesome "palpitation of the heart" sufficiently serious to cause fear for his life. Having recovered and returned to Padua, he was for a long time tormented by an intolerable headache on the right side of his head and a contemporaneous hyperemia in the right eye which caused him slowly to lose its sight, finally causing complete blindness in the right eye and, at the same time, a marked diminution of sight in the left eye. For many years he fought this serious infirmity with no other comfort than dissimulation and patience. Soon thereafter his sight was ruined in the left eye also. He bore such infirmity with a strong spirit, never complaining of so much misfortune, not even with the literati, his friends, of being deprived of the solace of reading books and of being obliged to dictate his writings. Morgagni, his colleague, his physician and friend, ascribed his heart ailment as well as his eye affliction and blindness to the pathological condition of the arteries, or, as we call it today, arteriosclerosis, correlated with gout which afflicted Ramazzini, as Morgagni wrote in "De sedibus et causis morborum per anatomen investigatis," Epistola Anatomica Medica III, Art. 8, Venice, Remondiana Publishing House, 1761, Vol. I, page 18.

The Church of Blessed Helen Enselmini (previously the Church of Saint Mary of the Armenians and which was consecrated in 1852 to St. Francis de Sales). The Church is on G. B. Belzoni between the numbers 70 and 72A.

In 1709, realizing that he was no longer able to attend to his teaching duties with the necessary preparations and assiduousness, Ramazzini planned to retire to private life and return to Modena permanently. Having manifested such an intention to the three governors of the University, he was begged to desist from his determination and asked to teach at will, as the condition of his health permitted. They added that for the Venetian Republic it sufficed to have Ramazzini as the titular professor of the University of Padua.

In that same year (1709) another pleasurable recognition was bestowed upon the venerable professor by the Academy of Berlin, which enumerated him among its members.

The didactic and scientific activity displayed by Ramazzini from 1700-1714 (from his 68th to his 81st year), in the midst of his infirmities and ailments of old age, is astounding and excites wonder. He published the second edition of "De morbis artificum diatriba," which came out in

1713 (Conzatti Publishing House, Padua) augmented by 13 new chapters relating to as many new professions; "De principum valetudine tuenda" (About the conservation of the health of princes), a precious compilation of hygienic and educational precepts for the young prince, heir to the throne of Modena; the letter to his grandson, Bartolomeo, on the abuse of Peruvian bark in therapeutics (Peruvian bark at that time was considered the panacea of all ailments); and finally the "Annotationes in librum Ludovici Cornelii de vitae sobriae commodis" (Annotations to the book of Luigi Cornaro on the advantages of a life of sobriety), printed in 1714, and representing Ramazzini's swan song, brought this period to a close. In this book he attempted to correct the inaccuracies of the author, a Venetian patrician who was not a physician, and to propagate good standards of individual hygiene for a temperate life, actively and zealously intent on public good.

In addition, the opening lectures of the school year covering the time spent in Padua were published. It was his custom to begin the academic year with an opening talk, "for the purpose of animating youth to study, after the long vacation, with a new and pleasing topic," aiming no less at forming and educating the character of his pupils than to instruct them. To this purpose should be recalled his opening speech of 1701 entitled, "Felicius curari a medico popularem gentem quam nobiles et principes viros" (It is happier for the physician to cure the common people rather than the nobles and princes). He prefixed his remarks by trying to persuade the young students they would obtain better clinical results and greater satisfaction in curing the common people than the elite, and in trying to inspire in them that love for the humble which he felt so profoundly and so efficaciously practiced. In his opening speech of 1706 "In medicina facienda remediorum simplicitatem operosae compositioni praeferendam" (In the Art of Medicine simplicity of remedies is to be preferred to complicated prescriptions) he attempted to direct the future doctors into a diligent study of the sick and to disturb as little as possible the healing processes of nature; to revolt against the bad custom of contemporary practicing physicians of mixing an infinity of remedies in certain doltish prescriptions. It is noteworthy to remember his opening speech of 1711 for its intrinsic merit. "De contagiosa epidemia quae in patavino agro et tota fere Veneta ditione in boves irrepsit" (About the contagious epizootics of the oxen which broke out in the territory of Padua and in almost the entire region of Venice) treated the bovine pestilence which appeared in the region of Venice and from there passed to the outlying regions with enormous destruction of cattle. It gives a succinct but very accurate study from the clinical point of view as well as from the epidemiological. This study for many years was considered one of his best.

In 1714, Ramazzini, in spite of being completely blind and afflicted with many attacks of gout, had not abandoned his teaching activity. On the 5th of November, while he was preparing to go to the University to give his 9:30 A.M. lecture, he was struck by a cerebral hemorrhage. After suffering for 12 hours he died, attended by his colleague Morgagni of the Faculty of Medicine. In the registry of the deaths of the city of Padua preserved in the Civic Museum in the parchment-bound volume which comprises the years 1711 to 1715 can be found the death certificate of Ramazzini which reads as follows: "November 5, 1714, the illustrious Bernardino Ramazzini, Public Professor, 80 years, because of an apoplectic stroke, visited by the Honorable Reatto and others, died at five o'clock P.M.; parish of Santa Sofia." Since at that time the enumeration of the hours for the month of November began at 5:30 P.M. and the legal day at midnight, the text means 10:30 P.M. of the 5th of November.

He was buried in the church of Blessed Helen Enselmini (previously the church of Saint Mary of the Armenians and which was consecrated in 1852 to St. Francis de Sales) which is on the street called G. B. Belzoni. Ramazzini lived on this same street in a house in front of the Church of the Orphans. His nephew, Bartolomeo Ramazzini, wrote a beautiful epitaph which was published in his uncle's biography prefixed to the "Opera Omnia" edited by Bartolomeo and published in Geneva in 1716. Owing to unpardonable negligence on the part of his heirs, the nephew of Francis de Medici, and the son of one of his daughters, this epitaph was not inscribed on his tomb and so his remains have been dispersed through successive and repeated restorations to the church. This epitaph is now on the facade of the church where it was recently placed.

In the Notarial Archives in Padua can be found Ramazzini's testament among the collection of deeds of G. B. Viaro, drawn up by him in 1713 (August 14) and approved in the presence of seven witnesses in the Sacristy of Saint Francis of Paola. In his will he disposed of his goods in favor of his heirs: his first-born daughter Cecilia, widow without issue; two orphaned grandchildren, the sons of his second daughter Sigismonda; and his nephew, Bartolomeo Ramazzini, son of his brother.

Ramazzini's activities were many. He loved literature and writing. Some of his manuscripts (most of which are unedited) are preserved in three codices in the Library Estense de Universitaria of Modena; one codex of 162 pages contains poems; another of 178 pages contains poems, medical letters, etc.; another of 122 pages contains letters and treatises. There is still another of 336 pages containing dissertations and academic discourses, some of which are his own compositions and others belonging to his relatives Bartolomeo and Antonio Ramazzini.

Thus much about Bernardino Ramazzini remains to be explored.

President's Page

PRIOR to World War II, the value of a well organized and well administered industrial health program to workers, to industry, and to the community in general, was appreciated almost exclusively by those physicians engaged in the practice of this specialty plus a relatively small percentage of management. The industrial expansion and manpower shortage occasioned by the second world War, demonstrated to management and to labor, the importance and necessity of good In-Plant health services. However, up to that time there were practically no organized programs in our universities for postgraduate training in Occupational Medicine, almost all physicians in industry having acquired their competence through medical apprenticeship and a slow accretion of experience. As a result of this demand for experienced Medical Directors, several universities developed formal programs of Postgraduate training. In the March, 1952, issue of *Industrial Medicine and Surgery* Dr. O. T. Mallery reported the results of a survey conducted under the auspices of the Industrial Medical Association's Committee on Education and Training. At that time, nine universities had some type of formal program for postgraduate education in Occupational Medicine although there was considerable variation in the curriculums and the degrees conferred. Twenty physicians then were engaged in full-time graduate study leading to a degree and 18 others were taking short or part-time courses not leading to degrees. A re-survey of the status of such training, conducted by the Committee on Education and Training and published in the April, 1953, issue of *Industrial Medicine and Surgery* indicated that the course content has become more uniform. It also revealed that there were then 29 physicians taking full-time courses leading to a degree and only seven taking short or part-time courses. A conclusion that may be drawn from this shift is that both physicians interested in this specialty, and the universities where such training is available, realize that an incidental part-time course does not make a physician into an Industrial Physician any more than a part-time course can make him an orthopedic surgeon or an ophthalmologist.

In March, 1951, Dr. Ernest Brown of the American Medical Association reported the results of a survey of 71 American Medical Schools which had indicated the existence of some instruction in Occupational Medicine in the undergraduate curriculum. This survey revealed a wide variation in the scope and content of such courses. Extremes ranged from two to 21 hours of instruction. In some schools the courses consisted almost entirely of visits to nearby industrial medical establishments. A few consisted of clinical clerkships. In 48 schools, this instruction was given either in the third or fourth years or divided between the two. In 12 schools the course was divided between the second and third, or the second and fourth years. In 11 schools, instruction was confined to the second year. Of the total of 71 schools, only one-third were considered to possess satisfactory orientation courses consisting of a minimum of 12 organized lecture or seminar hours and three hours of field instruction. In the remaining two-thirds, the courses were considered incompletely organized.

ONE may well inquire why there are only 29 individuals taking postgraduate training in Occupational Medicine if the demand for physicians qualified in this specialty is as great as it is reported to be. The lack of American Board status appears to be one important reason, since this undoubtedly acts as a deterrent to many physicians who otherwise would be interested in such a career. The other important reason appears to be the lack of adequate orientation of the undergraduate medical student to both the existence and the nature of Occupational Medicine. As a result, the great majority of medical students upon graduation, think of Occupational Medicine as concerned with compensation matters entirely, if indeed they think of it at all. Accordingiy, they plan their careers in the other specialties.

It, therefore, appears highly advisable not only for this Association but for all groups interested in the specialty of Occupational Medicine to bend their efforts toward the introduction of adequate orientation courses into those medical schools where such type of instruction is non-existent, and to strive to improve the course content in those schools where it now is inadequate. The individual Physician in Industry should be willing to offer his services as an instructor, since he is in the best position to acquaint medical students with the philosophy and the multiple facets of modern Industrial Medicine.

George F. Wilkins M.D.

Books

Employee Opinions

POLLS OF EMPLOYEE OPINIONS AND WHAT TO DO WITH THEM: Bulletin No. 21, California Institute of Technology. The Haddon Craftsmen, Inc., 1952, pp. 27, $1.00.

In this day and time among those occupied with industrial health is the strong and sane belief that the industrial worker himself, the recipient of industrial health ministrations, more directly and more extensively should be identified with the Medical Department and its program. In common parlance much comment has centered about the industrial worker as a member of the occupational health "team." While everyone is willing to accept the worker in this capacity, no one seems to know how to go about it.

Now comes the California Institute of Technology with its proposals as to polls of employee opinion. This thin booklet promotes the idea and embraces some results. In this example, it is somewhat striking that little or no mention is made of medical services and workers' opinions thereof. It is true that mention is made of physical work conditions such as noise, lighting, ventilation and wash room conditions. That may be important, but may not be sufficient. It is all well and good to procure the opinion of workers as to air conditions in this and that department, but rarely may it be believed that the workers' opinion is any substitute for a precise appraisal by industrial hygienists of air conditions and all similar situations. The worth of such responses from workers largely is limited to the registration of areas of disaffection and sore spots.

The further pursuits of "Caltech" in this matter of polls are unknown, but the wonder is, if this medium might be utilized in the procurement of the anonymous appraisal by workers themselves of the medical and industrial hygiene services. Possibly therein is an instrument for the better incorporation of the industrial worker into the occupational health team.

The Foot

FUNCTIONAL DISORDERS OF THE FOOT: FRANK D. DICKSON, M.D., and REX L. DIVELEY, M.D. J. B. Lippincott Company, Philadelphia, 1953, pp. 345, $6.75.

These authors seem to know about what they're writing. Let them speak for themselves from their own preface.

"The prevalence of functional foot disorders serious enough to cause definite foot discomfort and disability is recognized generally. It is not commonly appreciated, however, that the interference with comfort and efficiency which results from symptom-producing foot conditions is so widespread as to constitute a problem of considerable economic as well as medical importance. Unfortunately the medical profession as a whole has failed to evaluate correctly the seriousness of disabling foot conditions and consequently has failed to give them the study and attention they deserve. In addition, the public is inclined to look upon foot discomfort as not of sufficient gravity to demand professional advice and the expense of medical treatment, and it follows the most economical course which is self-treatment in the form of purchasing an alleged 'corrective' shoe or seeking comparatively inexpensive non-professional advice.

"As a result, the treatment of functional foot disorders has fallen largely into non-medical hands. Honest and conscientious as many of those without the medical ranks may be, the fact is true that many of them have not the fundamental training which entitles them to accept the responsibility involved. Because some of these non-medical groups lack knowledge of the primary causes of disorder and their effect upon the foot, we frequently find that important prophylactic measures are not applied at stages when the greatest benefit is to be derived from their use and that advanced cases of foot disorder are being inadequately treated."

Washing Water

WASHING OUR WATER: YOUR JOB AND MINE: HELEN BEAL WOODWARD. Public Affairs Committee Pamphlet No. 193, March, 1953, pp. 28, 25 cents.

In journeying to the Los Angeles I.M.A. conference, this book reviewer had stopovers in Denver, Boulder and Grand Canyon. Everywhere those encountered got around to a topic of major concern. Not always was it Korea; not always was it "affairs in Washington"; not always was it the atomic bomb trials then going on. The common denominator of conversation going on was "water." "Where's the needed water coming from?" "Who gets the available water?" "Why is even the digging of a well on private property regulated by law?" "How long will the droughts last?" The ultimate conclusion was that the future of the West rests heavily upon water! Even more importantly, that the food supply of the nation distinctly will be influenced by water in the West. Has it become possible that this age-old difficulty will not reach solution until in some economic manner ocean waters may be deprived of their unwanted content and be poured upon potentially fruitful lands and into water faucets?

Now comes this pamphlet. It is not so much devoted to the quantity of water but its quality—the conservation of the quality of water already available. This proponent of water betterment, among other topics, ties industry into the picture as an offender, in this language:

"The unprecedented growth of industry, together with our expanding cities, has burdened many of our rivers beyond their capacity to flush away waste. The seriousness of this, as it affects the health and general welfare of people and industry alike, is the subject of a new pamphlet.

"This problem has long been a matter of major concern to the U.S. Chamber of Commerce, declares Richard W. Smith, manager of the natural resources department, in a foreword to the pamphlet.

" 'The role played by industry in pollution control is increasing in importance,' points out Mr. Smith. He attributes this to 'a growing awareness that industry can profit by treating its waste fluids—in public relations as well as in dollars and cents by salvaging useful by-products.' He urges civic cooperation to make the streams of our land suitable for recreation and industrial use. 'Washing Our Water' tells how it can be done.

"Adequate waste disposal treatment is not easy or cheap to come by, concedes Helen Beal Woodward, author of the pamphlet. Within the next 10 years we shall probably have to spend from nine to 12 billion dollars for water purity, build 6,600 addition-

al sewage works and 3,500 more industrial waste treatment plants than we have now.

"Pollution from human sewage and industrial waste increases in two ways as citizen and industries grow. Less water is available to carry waste away, because of increased water demands and at the same time the water flushed back into the common supply carries a heavier burden of waste. Modern chemical industries have made the problem even more imperative, as ordinary methods of water treatment do not always affect the complex new chemicals.

"Industries are frequently encouraged into undertaking pollution control because of their own needs for pure water. Others have found that it pays off in cash. For example, a steel company decided to stop dumping furnace flue dust into the Ohio, and spent $516,000 on a treatment plant. In its first year the plant recovered enough ore to yield $581,000 profit.

"Disposal plants need not purify the water 100%, Mrs. Woodward points out. Streams purify themselves to a large extent, and can absorb a vast amount of waste. But even major rivers have their limits, and a thoroughly poisoned river has no chance to absorb all wastes. Disposal plants merely take out enough pollution so that streams can do their share.

"Among communities that have faced up to the problem of pollution control, the example of Florence, Alabama, is cited as spectacular. Here, through vigorous citizen action, this small city built a $90,000 sewage disposal plant and accepted a 50% rise in the cost of water to pay for it.

"Pollution control can only be achieved when each community similarly accepts responsibility for cleaning its own water, concludes Mrs. Woodward. The pamphlet is a challenge to every citizen to help bring this about."

This small booklet is one of a long series dealing with many aspects of public affairs. This particular pamphlet, along with a listing of other valuable ones still available, may be procured by inquiry accompanied by 25 cents directed to Public Affairs Committee, Inc., 22 East 38th Street, New York 16.

Physique and Behavior

ADJUSTMENT TO PHYSICAL HANDICAP AND ILLNESS: A SURVEY OF THE SOCIAL PSYCHOLOGY OF PHYSIQUE AND DISABILITY: BARKER, ROGER G. Social Science Research Council, New York, Bulletin No. 55, 1953, pp. 440, $2.00.

"There are many connections between the body and the mind that are open to scientific study. Physique and behavior are related via genetic, endocrine, neural, and psychosomatic mechanisms, for example. In this report we shall consider the somatopsychological relation between physique and behavior. This relation is concerned with those variations in physique that affect the psychological situation of a person by influencing the effectiveness of his body as a tool for actions or by serving as a stimulous to himself or others.

"Consider, for example, the radically different situations of a three-year-old child and of an adult in the same objective situation: both want to get a snack of bread and jam in the kitchen. The adult is able to approach the goal directly and easily; he is tall enough to reach the jam on the top shelf, he is strong enough to open the jar, and he is skillful enough to spread it on the bread. The three-year-old, on the other hand, solely because of the less effective tools that his physique provides, is faced with a difficult intellectual and engineering problem or with a problem of social persuasion. Behavioral adjustment to the effectiveness of the body as a physical tool for molar actions is one of the important phases of the somatopsychological problem."

For the Student of Health Education

INDIVIDUAL AND COMMUNITY HEALTH: WILLIAM W. STILES, M.D. The Blakiston Co., New York, pp. 492, $6.00.

The author doesn't fully say so, but this book is for the medical layman—the student of health education. Good for its purpose, it holds no illuminating values for the physician, save that it could be recommended by him for lay reading. Still, here and there are little gems rarely finding their way into print. For instance, the author mildly takes up the matter of the legal responsibility consequent upon undertaking first aid. He notes:

"In the case of *Osterland vs. Hill*, an intoxicated man fell out of a canoe near a dock. The drunk clung to the canoe and called for help from a man seated on the nearby dock, but to no avail. The drunk drowned and his relatives brought suit against the man on the dock. The relatives lost because there had been no relationship between the drunk and the man on the dock requiring that he go to the aid of the drunk.

"The laws of torts are a creation of common law and are concerned with the compensation of losses suffered by private individuals in their legally protected interests, through conduct of others which is regarded as socially unreasonable. It is found that one who injures another by an affirmative negligent act is generally held liable. For an omission to act, there is no liability, unless there is some definite relationship between the parties which is regarded by law as imposing a duty to act. The law has not recognized a general duty to aid a person who is in peril, but if the defendant enters upon an affirmative course of conduct, affecting the interests of another, he is regarded as assuming a duty to act, and will be liable for negligent acts and omissions (Prosser)."

Many a physician skilled in some aspect of medicine—such as a psychiatrist—but who wouldn't recognize a typical case of measles or possess ability beyond that of the layman in setting a bone, often tosses about on his fingertips what he should do in some emergency. Fully he knows his incapacities, that he will incur tremendous legal obligations should he do anything (and in the minds of the public every physician is presumed to be able to cope with anything), and so the temptation is, when witnessing an auto wreck, to drive on.

This act later might be interpreted as professional negligence.

The format of this book is not attractive. The publisher has added nothing to his laurels. Some of the illustrations are deplorable. On page 155 are two pictures of a cretin. About all that may be observed is that a human being is in the reproduction. Health education is an unpopular topic in non-professional schools. Part of the difficulty may reside in the inadequacies of textbooks. This present one contributes much and covers just about everything. If there be inadequacies, some are to be laid in the lap of the publisher.

INDUSTRIAL MEDICINE AND SURGERY

Editor CAREY P. McCORD, M.D.

Associate Editors:
HENRY S. BROWN, M.D.
JAMES T. CASE, M.D., F.A.C.S.
NATHAN SMITH DAVIS, M.D., F.A.C.P.
FRANK R. FERLAINO, M.D.
S. CHARLES FRANCO, M.D.
LYDIA G. GIBERSON, M.D.
CHESTER C. GUY, M.D., F.A.C.S.
EDWARD C. HOLMBLAD, M.D., F.A.C.S.
RUTHERFORD T. JOHNSTONE, M.D.
ADOLPH G. KAMMER, M.D.
ROBERT T. LEGGE, M.D., F.A.C.S.
CHRISTOPHER LEGGO, M.D.
ARTHUR R. METZ, M.D., F.A.C.S.
M. N. NEWQUIST, M.D.
CARL T. OLSON, M.D.
OSCAR A. SANDER, M.D.
WILLIAM P. SHEPARD, M.D.
FREDERICK W. SLOBE, M.D., F.A.C.S.
JAMES K. STACK, M.D., F.A.C.S.
ROBERT M. WATROUS, M.D.
WARREN A. COOK, A.B.
HENRY FIELD SMYTH, Jr., Ph.D.
WILLIAM P. YANT, D.SC.
EDWARD R. ASTON, D.D.S.
Overseas:
DR. AXEL AHLMARK, Sweden
PROF. DR. MED. E. W. BAADER, Germany
DR. JOHN E. EUSTACE, Ireland
DR. DOUGLAS GORDON, Australia
DR. GIOVANNI PANCHERI, Italy
PROF. DR. JOSE PEDRO REGGI, Argentina
DR. A. SALMONT, France
DR. G. W. SCHEPERS, Union of South Africa
DR. PERTTI SUMARI, Finland
DR. A. R. THOMPSON, England
DR. A. UYTDENHOEF, Belgium

ESTABLISHED 1932 — Publisher A. D. CLOUD

Volume 22 — SEPTEMBER 1953 — *Number 9*

New Diseases for Old

ONE of the admitted fetishes of this Journal is that a distinctive marking, setting industrial medicine apart from general medicine, exists in the fact that industrial medicine is a specialty which year by year deals with more new disease entities than all other medical groups combined. This distinction may not proudly be hailed, but it is a confronting fact.

In the pharmaceutical world, of all drugs sold over the druggist's counter, 90% have appeared in the past 15 years. The majority of older medicaments, little useful, have been relegated without precise disappearance to a state of unimportance.

So in the world of diseases many, while always threats, seldom are seen. Where is typhoid fever, or small pox, or pellagra, or tuberculosis? Replacements, although replacements are unwanted, spring from industry.

At the present time there are 600,000 named organic chemical compounds, as lately mentioned by Gustav Egloff before the Chemical Specialties Manufacturers' Association. He said:

"The possibilities are almost limitless when one considers that there are now 600,000 organic compounds and in a few years there may be over a million. Not only are new chemicals continually being introduced, but new specialty applications are being found for products already in use."

Loosely stated, there have been just 600,000 work days since the beginning of our time era, A.D. 1. Without consequence, that means one new organic chemical compound for every day of the Christian era. But, some 500,000 of these compounds have been man-made since 1900. The same type of figuring reveals 31 new compounds created on the average for every day of the past 53 years. In stark conservatism, at least one of these 31 is demonstrated to possess toxic properties or is potentially damaging. It follows that on this basis 15,900 chemicals are suspect, or, to be bolder, are damaging when manipulated without protective controls.

Industrial medicine, as just one professional obligation, has to face the affront, known and unknown, from these thousands of industry's chemicals. This is but an additive to manifold and manifest other requirements.

And yet there be those who contend that industrial medicine is not other than general medicine!

Weil's Disease

IN THE United States one neglected occupational affection is "Weil's disease" (Leptospira icterohaemorrhagiae). Not always is this disease of occupational origin any more than lead poisoning is always occupational. Wherever the disease arises, rats are likely present. This means that the common exposure points are on farms, around markets and abattoirs, grocery stores, and in mines.

We have left it to the thoroughness of the British to provide emphasis on the relative frequency of this infection as an occupational affair. In a series of publications in the *Transactions of the Association of Industrial Medical Officers* (January, 1953), Drs. Bell, Wilson and Sharp respectively have reported upon the occurrence of Weil's disease in sewer work, fish markets and coal mines. Eighty percent of the small number

of deaths of occupational origin among sewermen were attributed to leptospiral infection. The organism often is present in the kidneys of rats and contaminates the urine. Rat bites are a source of organism transfer, but bites are not essential since contact with water or moist articles contaminated by rat urine may result in the transport of the disease. In a serological investigation of healthy fish workers in Aberdeen, of 210 workers 51 provided reaction indicative of leptospiral antibodies. This figure represents more than 24% of those investigated. Throughout this series of publications, emphasis is directed to the missed cases.

As to mining, strangely enough the disease appears to be limited to coal miners. It seems that the technical methods of coal mining favor a rat population higher than for metal or shale mining.

Some indication of the severity of the infection is disclosed in this quotation: "All the eight fatal cases of 1951-52 appear from their case histories to have been so ill from the start as not to have had anything but a very remote chance of recovery. Two admitted on the sixth day of illness died on the same day—one had had four days' anuria. The factors associated with death were renal, hepatic and cardiac failure."

It is probable that Weil's disease as a trade disease is far more common in the United States than now realized. One more reason for warfare on rats appears. It is by no means certain that the rat is the only vector; dogs are under suspicion.

How To Handle Women

THE FINAL consummation is at hand. Now we are told how to handle women. Vera Green, as reported by the *Illinois Labor Bulletin* (March-April, 1953) provides the information:

"Too many of us have a tendency to confuse the issue of male and female workers, but the whole problem of women workers can be summed up in one sentence: Stop thinking women employees have any greater problems than men do, and realize that problems are not essentially female, but essentially those of human nature.

"Perhaps never before in history," she declared, "has one sex been singled out for such close scrutiny as the American woman is today. Educators, psychologists, sociologists, anthropologists are all debating her problems, their causes and cures. Yet a man from Mars would probably find this emphasis on women strange, since, the human race being what it is, both sexes are equally essential and the problems of one shouldn't be any more pressing than those of the other.

"In the approximately 20 million women in the labor force, 55% are married, 16% widowed or divorced, and only 29% single. If you are interested in knowing how these working marriages turn out, the answer may surprise you. Only 2% end in divorce as against 6 to 7% of the other marriages. Of the married women who work, more than five million have children under 18 years of age, while two and a half million have children under six years old.

"Frequently we hear that women do not like to work for women. That was perhaps a problem at one time, and may be a hand-me-down from the days when women in business were a novelty. Today the situation is quite different, and if you are having this particular difficulty in your company, either you have the wrong woman as supervisor, or you have nincompoops for office employees.

"It is time to stop generalizing about women and realize there are good and bad exceptions to every rule. There are some women supervisors who are hard to work for; some who are a disgrace to their positions.

"There are many other women executives who represent the new trend of women in management. A capsule description of our modern business women which could be used as a measuring stick is this: 'She is a combination of the old and the new—she is the old-fashioned gentlewoman who has retained her charm, her femininity and her fastidiousness; but who has added a degree of smartness, a glow from the outdoors, a freedom of activity, an analytical mind, an indisputable sense of humor, and the "ever-new" look of fashion.'

"Occasionally we hear that men will not work for women. Dr. Lillian Gilbreth answered this not long ago when she said, 'Some men don't like to work for women; some don't like to work for men; some don't like to work for anyone.'

"The plain fact is, abilities are comparable. How many men today are qualified as successful executives, yet who in themselves are nothing, because they rely almost entirely on the efficiency, the planning and the judgment of a competent woman secretary? There are all too many of them. The man provides the front, the woman does the work—from time immemorial this situation has existed—a woman—the power behind the throne of a man.

"Businessmen who read the signs of the times will do well to check the situation carefully, to give recognition of ability with proper remuneration and opportunity incentive before they find themselves in the reverse position some of these days—off in a dark corner with the crown astride some career gal's intellectual forehead."

For this, we are grateful. Still there lingers the conviction that not yet fully is man ready to cope with earth's greatest mystery—woman.

Significant Simplification in the Routine Management of *Bronchial Asthma*

Subcutaneously
or Intramuscularly as desired
For Home And
Office Treatment
With Minimum Discomfort

HP*ACTHAR *Gel*
(IN GELATIN)

*Highly Purified. ACTHAR® is The Armour Laboratories Brand of Adrenocorticotropic Hormone—ACTH (Corticotropin).

Self-administered As Easily As Insulin: A Patient Treated With HP*ACTHAR *Gel*

A woman 36 years of age had to be hospitalized five times in 18 months for severe status asthmaticus which usually developed after each respiratory infection.

The problem of recurrent attacks was effectively controlled when the patient was taught self-administration of HP*ACTHAR *Gel*. She has given herself five courses of HP*ACTHAR *Gel* during the past year. Each course took from 3 to 5 days, and the results were so satisfactory that *no hospitalization was required.*

(Levin, S. J.: Ann. Allergy 11: 157-169, 1953; Case 6)

Advantages of HP*ACTHAR *Gel*

Fewer Injections:

One or two doses per week in many instances.

Rapid Response, Prolonged Effect:

Combines the two-fold advantage of sustained action over prolonged periods of time with the quick response of lyophilized ACTHAR.

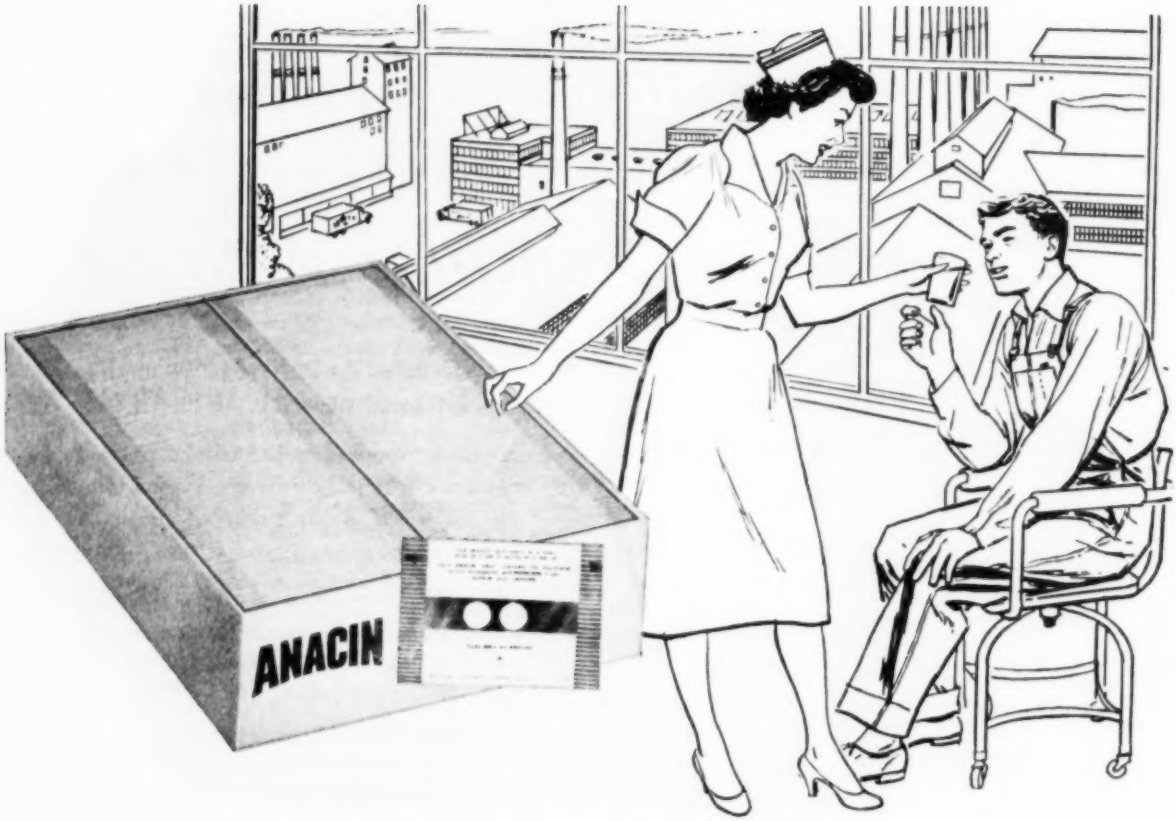
Much Lower Cost:

Recent significant reduction in price, and reduced frequency of injections, have advanced economy of ACTH treatment.

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY · CHICAGO 11, ILLINOIS

world wide dependability

PHYSIOLOGIC THERAPEUTICS THROUGH RESEARCH



Specially Packaged for Industrial Use

ANACIN . . . The Anacin Industrial Unit provides 250 cellophane envelopes, each envelope containing two Anacin tablets. This package offers the advantages of cleanliness and convenience for dispensing to individuals. It also assures the proper dosage in every case. Anacin is preferred in so many industrial dispensaries because Anacin gives fast, long-lasting relief from pains of headache, neuritis and neuralgia. When you order Anacin® tablets, order them in this special sanitary industrial unit, 250 envelopes, or 500 tablets, for $2.83.

BiSoDol Powder . . . Fast acting, antacid alkalizer . . . Packaged in a 16 oz. wide-mouthed bottle for easy, quick dispensing. BiSoDol® is exceedingly effective in relieving upset stomach, acid-indigestion, "gas," heartburn, sour stomach, fullness, nausea and other forms of distress when caused by excess stomach acidity. $2.00 each.

BiSoDol Mints . . . For greater convenience, BiSoDol is also packaged as mint tablets, 500 to the bottle. BiSoDol Mints are so palatable that they may be taken without water, if desired. $1.70 for 500 tablets.

PETRO-SYLLIUM . . . A mineral oil emulsion for the relief of constipation. Available either plain (blue label) or with phenolphthalein (red label). Petro-Syllium® is pleasant to take, gentle, thorough in effect. Packaged in 16 oz. bottles, $8.80 per dozen.

NEW! SPERTI BIO-DYNE® OINTMENT . . . For the treatment of burns, cuts, abrasions, contains biological substances obtained from yeast and fish liver cells which act in minute quantities directly on injured cells to stimulate their metabolism and proliferation. Minimizes scar formation—promotes rapid healing. Packaged in 15 oz. jars @ $48.00 per dozen. (Minimum shipment—3 jars.) Hospital size—5 lb. jar $15.50 per bottle.

REG. U.S. WHITEHALL PAT. OFF.

WHITEHALL PHARMACAL COMPANY • New York 16 • N. Y.

News, Comment, Opinion

Unsafe

OF THE more than 800 chemicals that have been suggested for use in processing foodstuffs, it is estimated that at the present time 704 are in use. Of those 704, only 428 are known to be reasonably safe for human consumption.

—*Ohio State Med. J.*, July, 1953.

Hazatrol

NEWLY-patented safeguard for machine operators is called Hazatrol, consists of radium-bearing wrist band and Geiger counter. The instant worker's hands leave "safe zone," Geiger counter picks up radiation and turns off machinery. Radiation can't be interfered with by movement of materials through machine, as is case with light-beam systems.

—*Personnel Executives' Newsletter*, 3:14 (July 31) 1953.

Imagination

TEACHERS and professors, whether they be in the business school or in the schools of science and engineering, must do more than teach the works of dead men and women. They must somehow learn to teach their students to think creatively. Creative thinking is closely related to imagination. Most children have it when they begin their education but many have lost it by the time they graduate from college. I implore you as teachers to keep this characteristic alive in your students—this ability to think creatively. Imagination, like many other parts of our being, must be used, trained and developed in order for it to grow straight. It grows stronger in use. You can't wear it out. Neglect it, fail to exercise it, forget it . . . atrophy sets in and we lose its power.

—F. D. LEAMER, Personnel Director, A.T.&T., at N.Y.U. School of Education (*New York World-Telegram*, July 24, 1953.

That Coffee Break . . . .

HERE'S a good word for the office worker's national institution: the coffee break. A National survey was made of 1,160 companies

Collapsi-Cot

The Lightest, Safest, Easiest Handling Stretcher

New improved adjustable back rest permits any positioning of the patient, from prone to sitting. Strong, light, rigid . . . Collapsi-cot weighs only 23 pounds. Simple and fast to set up—10 seconds and it is ready for use. It is easily maneuverable in tight places, stairways, and around corners where other means of moving injured presents problems. Folded it occupies a minimum of space, 45" long, 20" wide and 2¼" deep. Can be stored in wall mounted cabinet.

EMERGENCY AIDS COMPANY
3444 NORTH CLARK STREET CHICAGO 13, ILLINOIS

OUR 57th YEAR
WOODWARD
Medical Personnel Bureau
FORMERLY AZNOE'S
3rd floor • 185 N. WABASH AVE.
CHICAGO • 1
• ANN WOODWARD • *Director*

Founders of the counseling service to the medical profession, serving medicine with distinction over half a century.

POSITIONS WANTED

Medical Director: (175) Capable surgeon; six years, private industrial practice; four years, Assistant Medical Director, important company; ready to assume responsibility as Medical Director in industry.

Medical Director: (176) Graduate, leading eastern medical school; past seven years, Assistant Medical Director, major company, petro-chemical industry; well-seasoned by training and experience for industrial Directorship; middle thirties.

Medical Director: (177) Diplomate, Internal Medicine; FACP; past seven years, Medical Director, leading company, 22,000 employees; early forties.

Medical Director: (178) Well-trained and experienced, industrial toxicology; well-qualified surgeon; several years, consultant, industrial medicine; past six years, Medical Director, large important company; middle thirties.

Medical Director: (179) Degrees from leading Eastern universities; well-qualified in industrial surgery; active in industrial medical affairs; past seven years, Medical Director, major company; 10,000 employees.

Medical Director: (180) Graduate, Class "A" school; well-experienced all phases large industrial medical operations; past seven years, Medical Director, important company with plants in U.S.A. and foreign countries; late thirties.

Staff Physician: (183) Graduate leading eastern school; several years, surgical internship, teaching hospital; two years, USAMC; past year, successful private general practice; prefers industrial appointment; age, 32.

Industrial Nurse: (184) 36; Trained outstanding eastern school; single; several years, staff nurse, USA Nurses Corps; past five years, head nurse, large industrial food refining plant.

POSITIONS OPEN

Medical Director: (43) New post; major company, 35,000 employees; requires young outstanding man who has achieved success in industrial medicine both clinical and administratively; East.

Medical Director: (44) Under 40 who, as Assistant Medical Director of reasonably large industrial company now seeks "top level" directorship; new post; seven plants; 22,000 employees; must be able to organize good medical department each plant; $20-$25,000; East.

Medical Director: (45) Fairly large plant; one of important company; large city, university medical center; East.

Medical Director: (46) To establish and head program in large company; new post; South.

Medical Director: (47) regional plant, major company; 4000 employees; Midwest.

Medical Director: (48) Familiar with toxicological problems; plant 1800 employees; will also develop medical program for executives in New York headquarters office.

Staff Physician: (49) Preferably with formal training in industrial medicine and Public Health; Assistant Medical Director; important company; 6,000 employees; large university city; $10-$12,000; East.

Staff Physician: (50) Steel company; may also develop own practice; will be on staff of excellent hospital; fine town 25,000; East.

Many other fine staff positions in all sections of the country, including foreign assignments.

Please write for an ANALYSIS FORM so we may prepare an individual survey for you.

STRICTLY CONFIDENTIAL

which permit a 10- or 15-minute morning recess for coffee and chatter. It reported: less worker fatigue in 82% of the companies; better employee morale in 75%; increased productivity in 62%; fewer accidents in 32%; less labor turnover in 21%; some companies maintain cafeterias or snack bars which serve coffee. Others deliver it to the desks or permit employees to arrange to bring coffee from outside. One company, Mutual Life Insurance of New York, figures that the coffee break saves $130,000 a year in over-all labor costs when the coffee is delivered to the workers' desks.

—*Changing Times* (The Kiplinger Magazine), June, 1953.

Little Niceties

PLETHORA of women production workers these days often presents morale problem that doesn't respond to usual treatment, since even best-run factory cannot provide little "niceties" that appeal to the ladies. Step in this direction, though, is taking cue from many supermarkets, installing "hostess" in plant to supervise free periods, tend to individual wants, and generally act as confidante.

—*Personnel Executives' Newsletter*, 3:14 (July 31) 1953.

Rehabilitation

NEW YORK University-Bellevue Medical Center, Institute of Physical Medicine and Rehabilitation, 400 East 34th Street, New York 16, is offering a four weeks' course in, "Advanced Physical Rehabilitation Methods for Physical Therapists," November 23 through December 18, 1953, February 1 through February 26, 1954, May 2 through May 29, 1954 (four points University credit). The Institute is also offering a three weeks' Seminar in "Physical Rehabilitation Methods for Nurses," October 26 through November 13, 1953, January 4 through January 22, 1954, April 5 through April 24, 1954.

Tension

THE literature as well as statistical surveys indicate that the so-called "tension state" is rapidly becoming the most common "disease" the physician encounters in his practice. Many terms have been applied to this condition but not one, as yet, is universally accepted. Psychosomatic disease, anxiety state, neurosis, functional disease, psychoneurosis, are a few of the terms employed. Tension state probably best describes the clinical or presenting symptomatology of the patient. It has now been well established that approximately one-third of all patients seeking medical aid present purely functional symptoms, the second third are bothered with a mixed group of both functional and organic disorders, while the last third come to the physician because of serious organic disease.

—From "Tension State—A Practical Approach," by GREGORY E. FLORIDIS, M.D., in *Ohio State Med. J.*, July 1953.

DOME PREVENTIVE THERAPY MANS THE GUNS AGAINST DERMATITIS AND RELATED OCCUPATIONAL DERMATOSES . . .
DERMATITIS
THEY SHALL NOT PASS
INDUSTRY
★REDUCE ABSENTEEISM
★SLASH INSURANCE RATES
★BANISH OVERTREATMENT DERMATITIS
You can now prevent contact Dermatitis by preserving the Acid Mantle of the skin . . . with . . . . .
Acid Mantle Creme
The HOUSE OF DOME, exclusively serving the field of dermatology, is proud to present for the approval of industrial medicine its widely-heralded new ACID MANTLE CREME. The regular use of this new DOME development after washing, wet-work or any exposure to primary irritants quickly restores the normal acidity to the skin. ACID MANTLE CREME itself possesses a pH of 4-2 combining the benefits of acidifying action with the healing and soothing properties of a buffered solution of aluminum acetate.
Packaged in 1 oz. Tubes, 4 oz., 1 and 5 lb. Jars.
WHENEVER SOAP IS USED
ACID MANTLE CREME
SHOULD ALSO BE USED
MANUFACTURED IN U. S. A. BY
DOME CHEMICALS INC.
109 W. 64th STREET, NEW YORK 23, N. Y.
FREE
SAMPLES and literature. Yours for the asking . . . attach this coupon to your letterhead, or write . . . Dept. 18.
DOME CHEMICALS INC., 109 W. 64th STREET, NEW YORK 23, N. Y.
NAME
ADDRESS

Skin Disorders

OCCUPATIONAL skin disorders play no favorites—the white collar worker may be affected as well as the factory employee handling highly toxic materials. Skin eruptions among office workers resulting from allergies to office equipment constitute about 3% of the cases seen by industrial dermatologists, according to DR. GEORGE E. MORRIS, Boston, Assistant Clinical Professor of Dermatology at Tufts College Medical School. Writing in the July 25 *Journal of the American Medical Association*, DR. MORRIS reported on an analysis of 1,213 patients with dermatitis caused by industrial factors. Among the patients were 36 office workers who contacted the conditions from paper, carbon paper, glue, cardboard, various machine dyes and inks and the chemicals used to remove them, paper towels, rubber bands, rubber thumbs, pencils and soap. Three cases were described. One was that of a man who had a rash on and between his fingers due to the various rubber products used in his office. The second was that of a stenographer who had an eruption on her hands found to be the result of an allergy to the liquid soap from a soap dispenser in the office building where she worked. The third was that of a clerical worker who had an eruption on her fingers caused by the paint on the outside of the pencils she was using.

Full Coverage

IN THE past, private insurance carriers, with few exceptions, have opposed the broad coverage of occupational diseases in workmen's compensation legislation. However, at the 1949 convention of the International Association of Industrial Accident Boards and Commissions, the representative of one of the largest workmen's compensation insurance carriers in the United States made a convincing statement in favor of full coverage of occupational diseases. He pointed out that new industrial processes are constantly creating new occupational disease hazards and cited the following examples: the lung-cancer hazard discovered recently in the chromate industry, beryllium poisoning found in plants producing beryllium compounds as well as in plants using beryllium in manufacturing operations; and the poisoning caused by the increasing use of extremely dangerous elements found in insecticides. He referred also to the expanding use of plastics and new chemicals which may cause occupational diseases not now known, and to the increasing radiation hazard resulting from the atomic energy developments.

—From "Workmen's Compensation in the United States—IV: Occupational Diseases," by BRUCE A. GREENE, in *Monthly Labor Review*, July, 1953.

Sic

"TO SAFEGUARD employees' health, the Burry Biscuit Corporation maintains a modern Medical Department with a dispensary operating under a full-time Medical Director. A registered nurse is on duty during each eight-hour shift, from 7 A.M. to 3:30 P.M., and from 3:30 P.M. to midnight. EUGENE J. PETIT, personnel manager, is in charge of

THERE'S A NEED FOR THE

NEW *Surgiset, Jr.**

ETHICON® Cuticular Sutures in a Sterile Pack Jar with a handsome, nontip base

attractive unit Surgiset, Jr. . . . a sturdy white plastic nontip base holds the handy Sterile Pack Jar securely. This base is yours upon request with the purchase of one dozen of any of the ETHICON Cuticular Sutures.

for emergency and everyday use Each tube sterile inside and out—sutures always ready for use. Sutures swaged to Atraloc® Tru-Tempered Needles. Your choice of needle-suture combinations most often used for emergency repair, general and plastic surgery.

Available in four widely-used materials—Black Braided Silk (Serum-Proof), Monofilament Nylon, Dermal, Gut.

*T.M.

ETHICON SUTURE LABORATORIES INCORPORATED
NEW BRUNSWICK, NEW JERSEY

A NEW *Quick* TOPICAL ANESTHETIC FOR OFFICE AND DISPENSARY

Americaine AEROSOL

AUTOMATIC SPRAY TOPICAL ANESTHETIC
CONTAINING 20% DISSOLVED BENZOCAINE

Just press the button and spray on this quick topical anesthetic. Clean, sanitary, painless to apply to traumatized areas. Prompt, sustained control of surface pain and itching. Bacteriostatic, helps prevent infections.

For—
- BURNS
- ABRASIONS
- LACERATIONS
- ECZEMAS
- WOUND DEBRIDEMENT

Also Available:
AMERICAINE Topical Anesthetic Ointment in ½ and 1 lb. jars.
FREE—*Send for Samples and Literature.*

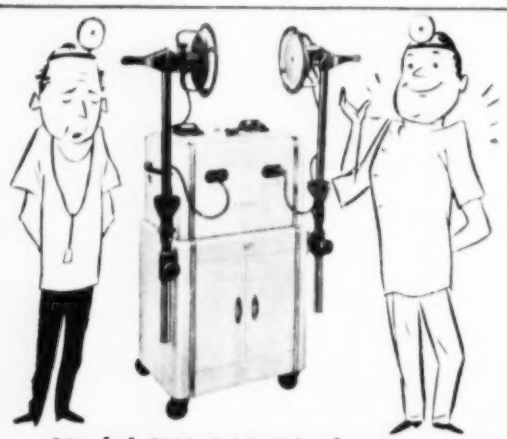
ARNAR-STONE LABORATORIES, INC. 1316-D Sherman Ave., Evanston, Illinois

the Medical Department, which is being moved into larger quarters in the biscuit company's Waverly Terminal plant. This space, adjoining the personnel department, was vacated when the company's offices were moved into the new administration building on Durant street. Injuries are given immediate, expert treatment at the dispensary and illnesses, aches or pains receive equally prompt professional attention. Two private rest rooms with beds are ready if the need arises. DR. I. E. COHEN, who was appointed Medical Director of the company in January, is available for examination, consultation and medical advice in the event of illness of any employee. No charge is made for this service. If the condition warrants it, DR. COHEN will recommend treatments or a visit to the patient's family physician."

—*Elizabeth, New Jersey, Journal* May 27, 1953.

Accident Facts

OCCUPATIONAL accidents in 1952 cost American industry $45 per worker, according to the National Safety Council's statistical annual, "Accident Facts." Just off the press, the 1953 edition points out that 15,000 persons



Model SW 660 Diathermy

Which one has the L-F Diathermy

HINT: Time saving features make L-F Diathermy owners happy.

L-F SYMBOL OF DEPENDABILITY AND PERFORMANCE

THE LIEBEL-FLARSHEIM COMPANY
CINCINNATI 15, OHIO

THE KEELEY INSTITUTE

treating exclusively

ALCOHOLISM

and other addictive diseases

•

TELEPHONE NO. 2 • DWIGHT, ILLINOIS

Registered by American Medical Association.
Member of American Hospital Association.

RESULTS COUNT!... In Superficial Fungous Infections *especially* **DERMATOMYCOSIS PEDIS** (Athlete's Foot)

ANTI-MYCOTIC
ANTI-PRURITIC
ANTI-BACTERIAL

USE **Desenex®**

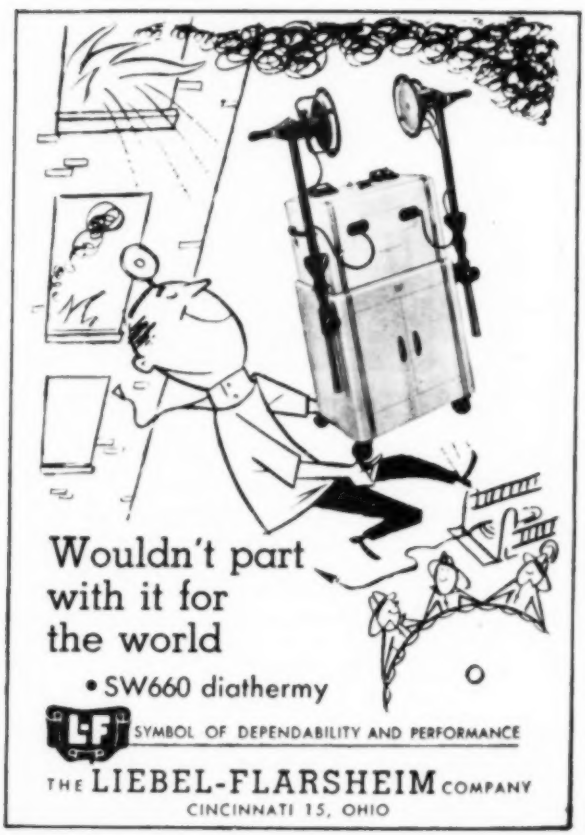
Ointment and powder of ZINCUNDECATE
Solution of UNDECYLENIC ACID

Cures average case in one to three weeks

W&T *Pharmaceutical Division*
WALLACE & TIERNAN PRODUCTS, INC., Belleville 9, N. J., U.S.A.

PD-32

were killed and 2,000,000 injured while at work in 1952. The total time lost as a result of occupational injuries reached the staggering total of 250,000,000 mandays. Twenty pages of the 96-page book are devoted exclusively to occupational accidents, and provide the factual background necessary to give direction to an industrial safety program. There is a detailed list of accident rates by major industry groups, as well as charts showing the accident trend during the past 25 years. Commonest source of injuries, part of body most frequently injured, off-the-job accident problems, unsafe acts and unsafe conditions contributing to permanent impairments and deaths, and other topics are included. In addition to the occupational section, detailed statistical information is provided on accidents of all types —motor vehicle, transportation, home, farm and school. Single copies of the book may be obtained from the National Safety Council, 425 North Michigan Ave., Chicago 11, Ill., at 75 cents each. Prices are reduced for quantities.



Wouldn't part with it for the world

• SW660 diathermy

SYMBOL OF DEPENDABILITY AND PERFORMANCE

THE LIEBEL-FLARSHEIM COMPANY
CINCINNATI 15, OHIO

One of America's largest industrial enterprises is seeking a doctor to organize and administer an Industrial Medicine Program.

•

The man selected must, of course, be a graduate of an accredited medical school, possess substantial medical background, be a member of the American Medical Association, and be certified by the American Board of Internal Medicine or its equivalent.

•

Beyond this, however, he must possess, to a *high degree, administrative ability, the quality of cooperating with and winning the cooperation of others and the capacity to conceive, define and administer practicable programs designed in the light of need and in tune with the developing high standards in the industrial medicine field.*

•

The man selected should have both experience and maturity.

•

The man who feels qualified and who would like to accept the challenge which this opportunity offers, as well as the salary which these responsibilities will justify, should address a letter to Box 333, in care of this journal, stating his interest and complete personnel and experience data.

Watchword for Watch-watchers

For today's BUSY physician — it's "Foille First in First Aid" in the treatment of burns, minor wounds, abrasions, in office, clinic or hospital.

ANTISEPTIC • ANALGESIC

FOILLE

LIQUID OR OINTMENT

You're invited to request literature and samples.

CARBISULPHOIL COMPANY

2921 SWISS AVENUE • DALLAS, TEXAS

Congress of Cardiology

THE Second International Congress of Cardiology will be held in Washington, D.C., September 12-15, 1954. It will be immediately followed by the Annual Scientific Sessions of the American Heart Association, September 16-18, 1954. The opening session will be held in the auditorium of Constitution Hall at 10:30 A.M. on Sunday, September 12, 1954, with addresses of welcome. A reception will be given at the Mayflower Hotel at 5:00 P.M. on the same day for all Members of the Congress and their families. A banquet will be held September 15, 1954 at 7:30 P.M. The Scientific Sessions lasting three days will include formal papers, panel discussions, clinical pathological conferences and visits to important medical centers in Washington and Bethesda. The program will be printed in French, Spanish and English. Immediate translation of some of the papers and discussions will be made in three languages. A series of Post-

If you think she's HOT
. . . wait till you see my
new L-F DIATHERMY.
Beautiful ivory or walnutone finish cabinets. Flexible applicators and POWER TO SPARE. Most application set-ups made in 9 seconds or less.
Model SW 660 Diathermy
SYMBOL OF DEPENDABILITY AND PERFORMANCE
THE LIEBEL-FLARSHEIM COMPANY
CINCINNATI 15, OHIO

Reece Wood Sole Acts As Splint

REECE ORTHOPEDIC SHOE

No. x175-CG—Men's No. x173-CG—Women's

for

BROKEN FOOT BONES
CRUSHED TOES SWOLLEN FEET

SMOOTHLY finished WOOD SOLE with AIRFOAM insole acts as splint. Keeps injured foot immobile.

Keeps a man on the job despite injuries. Fits over bandages. Easily stocked—no lefts—no rights. Also available without foot guard.

SIZES — SMALL-MEDIUM-LARGE

WRITE FOR FOLDER

REECE WOOD SOLE SHOE CO.

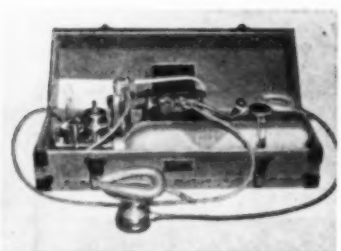
Dept. M Columbus, Nebr.

PROTECT

The Critical First Few Minutes

after breathing ceases with a

Stephenson Minuteman Resuscitator



Give Your Employees

the best insurance available in all emergencies involving respiration.

This small compact life giving apparatus weighing only 30 pounds, does more for victims of shock, gases, smoke, heart attack, asthma and the like.

Write today for demonstration without obligation or for Pamphlet M9.

STEPHENSON CORPORATION
RED BANK NEW JERSEY

Makers of the Harger Drunkometer for determination of intoxication by analysis of breath.

Congressional visits and conferences to at least 20 of the leading cardiac clinics in different parts of the U.S. and Canada has been arranged by special committees of local Heart Associations in the various cities.

Eye-Testing Program

THE employee eye-testing program which Cone Mills began two years ago is paying dividends. Not only has worker efficiency been improved and accident hazards reduced, but employee morale, of which the first two mentioned benefits are always by-products, has enjoyed a considerable improvement. Because of the program, innumerable workers now enjoy greater confidence in their work, as well as more enjoyable leisure time during their off-hours. . . . Human as well as material benefits are gleaned from Cone's eye program. For example, a young man was training for the job of spindle plumber under the direction of his father. Though the young man was obviously bright, he couldn't seem to master the work his father had been doing for years. He was filled with thoughts of failure and inferiority, while his father was, of course, perplexed. A check of the young man's eyes quickly showed him to be lacking normal depth perception, a prerequisite for the job in which he was training. Naturally, he has changed to another department, thus increasing working efficiency, as well as the happiness of the family concerned. . . . Another young employee discovered with faulty vision was sent to have his vision corrected. A check revealed that the trouble lay not in his eyes but in his teeth, and when a bad tooth was pulled it was only a matter of time until his eyes returned to normal. Another employee was found, after referral to a doctor, to be suffering from optic atrophy. Though there seemed to be little that could be done for him, doctors are still working on his case. Perhaps the most striking example of the value of good vision in the prevention of accidents is illustrated by the employee who had suffered the same accident at the same machine involving the same finger three different times. Since he has had his vision corrected, the accident has not been repeated.

—*Textile Bulletin*, Charlotte, North Carolina, May, 1953.

Rugged

. . . but his Hands need Protection

STEPAN

pH-6

The lotion-like skin cleanser

pH-6 is a specially formulated, sulfonated oil, bland skin cleanser . . . amazingly effective in removing oils, greases, and other industrial grime. Lotion-like effect actually protects the skin . . . leaving it clean, smooth, and supple.

Neutra-Foam

New mild synthetic skin detergent with excellent foaming properties. Leaves no disagreeable soapy odor on the skin.

You'll find both pH-6 and Neutra-Foam are surprisingly economical. Send coupon for literature and samples.

STEPAN
CHEMICAL COMPANY

The Stepan Chemical Co. IM
20 N. Wacker Drive, Chicago 6, Illinois
Please send pH-6, Neutra-Foam literature and samples.
Name
Firm
Street Address
City and State

FOR SYMPTOMATIC RELIEF

from DYSMENORRHEA

due to the Spastic Contraction of the Uterine Smooth Muscle

use HILLMAN'S 'D' COMPOUND

In industry today the most common cause of female absenteeism is dysmenorrhea. Its headache, backache, and cramp-like pains rob women of countless productive hours each month.

HILLMAN'S "D" COMPOUND offers prompt, effective relief. Patients return immediately to work, thus reducing costly absenteeism.

Used in industry for over twenty years

FREE SAMPLES WILL BE SENT FOR YOUR CLINICAL TRIAL

HILLMAN PHARMACEUTICAL CO.

185 North Wabash
Chicago 45, Illinois

Emotional First Aid

INDUSTRIAL psychiatry has justified its bid for a place in American industry by helping to forestall or prevent serious mental and emotional disturbances among employees, a New York University-Bellevue Medical Center conference was told yesterday. The statement was made by DR. LYDIA G. GIBERSON, personal adviser to employees at the Metropolitan Life Insurance Company. Speaking at a meeting under the joint auspices of the New York University Post-Graduate Medical School's Department of Industrial Medicine and the American Academy of Compensation Medicine, DR. GIBERSON declared that industrial psychiatry has proved its worth "not only by the human factors involved but also by cold hard gain in efficiency, morale and profits." She told 75 physicians and representatives of management and labor groups at the New York Academy of Medicine, that she did not consider industrial psychiatry an exact science, but, rather, "an emotional first aid station." "Most American Workers," she said, "have made their adjustments to industrial living, and if their existence is not upset too radically, they will continue to function smoothly and consistently with only normal lapses for illness and age crises. In any large organization, however, there will be at any one time a fairly constant 20 to 25% of the workers, who for chronic or temporary causes, are unable to bear efficiently the stresses of industrial work." DR. GIBERSON said that the hours now spent by corporations in the handling of employee problems could be reduced by close cooperation between personnel, the Medical Department and management.

—*New York Times*, May 22, 1953.

EXTRA Power
EXTRA Time saving convenience

The Model SW 660 Diathermy

LF SYMBOL OF DEPENDABILITY AND PERFORMANCE

THE **LIEBEL-FLARSHEIM** COMPANY
CINCINNATI 15, OHIO

MOISTAIRE
Heat Therapy Apparatus

PRODUCES
A Heated Environment of air saturated with water vapor based on the principle of dew point control.

Write, wire or call for Illustrated Information

The **RIES** *Corporation*

515 SOUTH AIKEN AVENUE
PITTSBURGH 32, PENNA.
SChenley 1-7000

Now available for civilian use—

U. M. A. PNEUMATIC TOURNIQUET

The tourniquet that is accepted and now being used by the U.S. Military Services

A Complete Unit

Manufactured in strict compliance with government specifications and supplied with a compact dustproof and waterproof aluminum carrying case.

Soundly engineered and sturdily built for long periods of carefree service.

Absolutely leak proof.

ADVANTAGES

Quick and simple application.

Freedom from leakage permitting prolonged application.

Wide surface envelope to prevent nerve and arterial injury and postoperative pain.

Sensitive accurate pressure guage to indicate pressures at all times.

Easily and quickly inflated with a few strokes of the pump.

A MUST FOR EVERY HOSPITAL AND FIRST AID STATION

At the phenomenally low price of

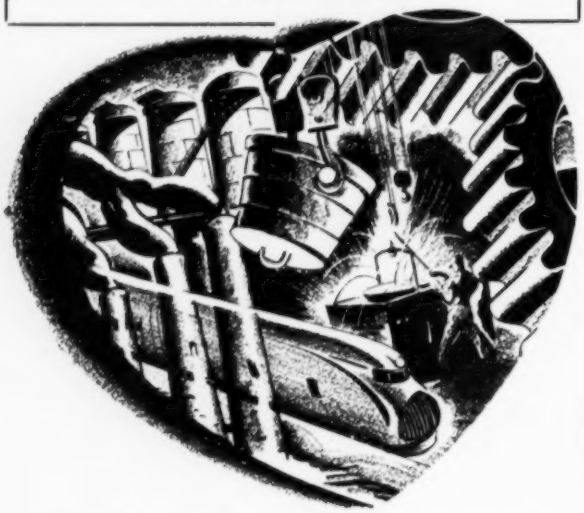
$67.50

Write us

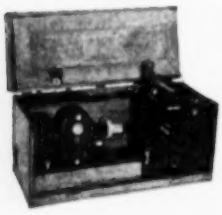
U. M. A. Inc.

56 Cooper Square **New York 3, N. Y.**

APPRAISING HEARTS IN INDUSTRY



Industrial Medicine demands the most accurate and dependable cardiac diagnostic equipment procurable. The large and growing number of Cambridge Instruments used in industry and commerce, is, therefore, significant. The Electrocardiograph is almost invariably recommended by a consulting Cardiologist who has been accustomed to Cambridge accuracy and dependability since internship. Furthermore, the Industrialist has excellent facilities for appraising comparative values of such equipment. They demand the best; accordingly the Cambridge Electrocardiograph becomes the instrument of choice.



"Simpli-Trol" Portable Model The instrument shown and other Cambridge Standard String Galvanometer Electrocardiographs may be arranged to record heart sounds, pulse and Electrocardiographs simultaneously.

"Simpli-Scribe" Direct Writer The "SIMPLI-SCRIBE is designed for supplementary use by Institutions and Doctors who operate Cambridge String Galvanometer instruments as their primary equipment.

Send for descriptive literature

CAMBRIDGE ALSO MAKES . . . .
Electrokymographs, Plethysmographs, Amplifying Stethoscopes, Research pH Meters, Blood Pressure Recorders, Instruments for Measuring Radioactivity, etc.

CAMBRIDGE INSTRUMENT CO., INC.
3716 Grand Central Terminal, New York 17, N.Y.
Cleveland 15, 1720 Euclid Avenue
Philadelphia 4, 135 South 36th Street
Chicago 12, 2400 West Madison Street

CAMBRIDGE
ELECTROCARDIOGRAPHS
Pioneer Manufacturers Of The Electrocardiograph

QUALITY!
ECONOMY!
FLEXIBILITY!
with

GAUZTEX
SELF-ADHERING GAUZE

Gauztex Professional Package 12" x 10 yd. Regular, Flesh-Tint or Oil Resistant

QUALITY!

You can't beat genuine Gauztex for quick, lasting cohesion whether you require Regular Gauztex with its natural rubber latex coating or Oil-Resistant Gauztex with its plasticized synthetic resin coating. *Gauztex is best.*

ECONOMY!

The use of Gauztex means faster-bandaging . . . far faster bandage removal . . . no time wasted cleaning off sticky residue because Gauztex comes off *clean!* Employees lose less time from the job.

FLEXIBILITY!

Cut-to-order service on Gauztex gives you exactly the sizes you need most in the professional 12" x 10 yd. roll. Simply specify the cuts you want . . . ½", ¾", 1½", 2" or wider cuts . . . so long as your combination totals 12". Here's more economy of time for you.

IT PAYS TO INSIST ON GAUZTEX
Professional sample sent on request

Of course you know Gauztex, the self-adhering bandage. It is the outstanding name in cohesive gauze, advertised nationally and to the profession. If you desire more detailed information please write.

GENERAL BANDAGES, INC.
531 Plymouth Court Chicago 5, Illinois

CLINICAL REPORTS

Persistent Psoriasis cleared with RIASOL

The clinical file cards of physicians who have used RIASOL in the treatment of psoriasis show remarkable results. In some cases the thick crusted lesions had been present for many years without any remission, in spite of various local medications.

When RIASOL is applied according to directions, the results in stubborn cases of psoriasis may appear almost unbelievable. Patches which have been present for years may disappear in weeks.

Physicians who have been discouraged by slow, uncertain results with chrysarobin, tar, salicylic acid and other local medications are invited to try RIASOL. Not only are therapeutic results usually better, but local irritation is largely avoided as well.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin invisible, economical film suffices. No bandages required. After one week, adjust to patient's progress.

Ethically promoted RIASOL is supplied in 4 and 8 fld. oz. bottles at pharmacies or direct.

Before Use of RIASOL

After Use of RIASOL

MAIL COUPON TODAY — TEST RIASOL YOURSELF

SHIELD LABORATORIES 1M-9-53
12850 Mansfield Avenue, Detroit 27, Michigan

Please send me professional literature and generous clinical package of RIASOL.

_____ M.D. _____ Street

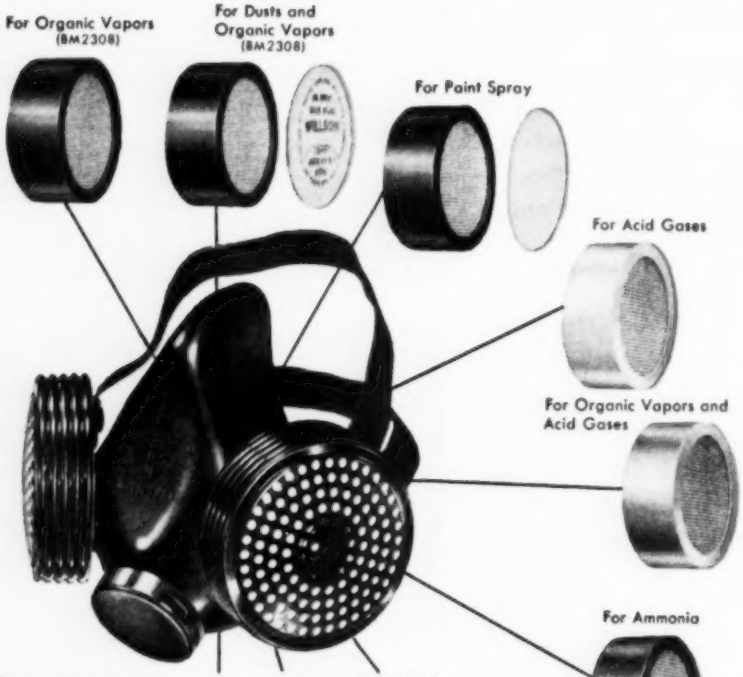
City _____ Zone _____ State _____

Druggist _____ Address _____

RIASOL for PSORIASIS

NEW WILLSON Interchangeable Respirator

First truly interchangeable respirator. Requires no additional parts or accessories to use any one of the cartridges, filters, or combinations shown.


For Organic Vapors (BM2308)
For Dusts and Organic Vapors (BM2308)
For Paint Spray
For Acid Gases
For Organic Vapors and Acid Gases
For Ammonia
For Metal Fumes, Dusts, and Mists (BM2149)
For Radioactive and Beryllium Dusts, Mists or Fumes
For Dusts and Mists (BM2162)

These Respirators are individually packed in sealed, transparent plastic bags enclosed in a sturdy metal-edge box.

Write for the new bulletin fully describing these new Willson Respirators. Standardization on the new Willson No. 800 Interchangeable Respirator can greatly simplify your respiratory protective inventory.

More than 300 Safety Products Carry This Famous Trademark

WILLSON®

Established 1870

WILLSON PRODUCTS, INC., 213 Washington Street, Reading, Pennsylvania

Advertisers

Abbott Laboratories ... 11
Armour Laboratories ... 41
Arnar-Stone Laboratories 46
Ayerst, McKenna & Harrison ... 9
Becton Dickinson Co. ... 33
Breck, John H., Inc. ... 13
Bristol Myers Co. ... 3rd Cover
Burroughs Wellsome Co. 28
Cambridge Instrument Co. ... 58
Carbisulphoil Co. ... 48
Cereal Institute ... 24
Ciba Pharmaceuticals ... 4th cover
Davis & Geck ... 2, 31
Desitin Chemical Co. ... 34
Dome Chemicals ... 44
Eaton Laboratories 2nd cover
General Bandages ... 52
Hillman Pharmaceuticals 50
Keeley Institute ... 46
Liebel Flarsheim Co. ... 46, 47, 48 and 50
Lilly, Eli, & Co. ... 40
Merck & Co. ... 35
Mine Safety Appliances 20
National Drug Co. ... 36-37
Pfizer, Charles, & Co. 1, 21-3
Reece Wood Sole Shoe Co. ... 40
Ries Corp. ... 50
Roerig, J. B., & Co. ... 15
Rystan Co. ... 32
Sacro Matic, Inc. ... 39
Schenley Laboratories ... 5
Schering Corp. ... 25
Shield Laboratories ... 53
Smith, Kline & French ... 29
Standard Pharmaceuticals 12
Stepan Chemical Co. ... 49
Stephenson Corp. ... 49
Upjohn Co. ... 17-19, 26-27
U.M.A. ... 51
Wallace & Tiernan ... 47
Westwood Pharmaceuticals ... 16
Whitehall Pharmacal Co. 42
Willson Products ... 54
Winthrop Stearns ... 7
Woodward Medical Personnel ... 43
Wyeth, Inc. ... 30, 38

Faster pain relief
Fewer side-effects
with BUFFERIN

Studies in eight clinics of a large industrial organization show that BUFFERIN "can be used in an industrial clinic with greater freedom from side-effects than can ordinary aspirin, and is four to five times better tolerated than ordinary aspirin."[1] Actual clinical research[2] proves that BUFFERIN *is absorbed twice as fast as aspirin and does not upset the stomach.*

BUFFERIN is Better Tolerated than Aspirin.[1]
An industrial physician writes: "A worker who cannot stay at his job because he has a bad headache is not really much better off if his complaint is alleviated by an analgesic that leaves him with nausea which also incapacitates him."[1]

REFERENCES:
1. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951.
2. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid. J. Am. Pharm. Assoc., Sc. Ed. 39:21, Jan. 1950.

EACH BUFFERIN TABLET contains 5 grains of acetylsalicylic acid, together with optimum amounts of the antacids aluminum glycinate and magnesium carbonate.

Accepted Council on Dental Therapeutics American Dental Association

THE SPECIAL INDUSTRIAL PACKAGE MAKES DISPENSING EASY

A box of 250 individual packets, each containing two BUFFERIN tablets, hermetically sealed in aluminum foil lined with protective cellulose acetate. The special low cost is $3.25. Order your package today.

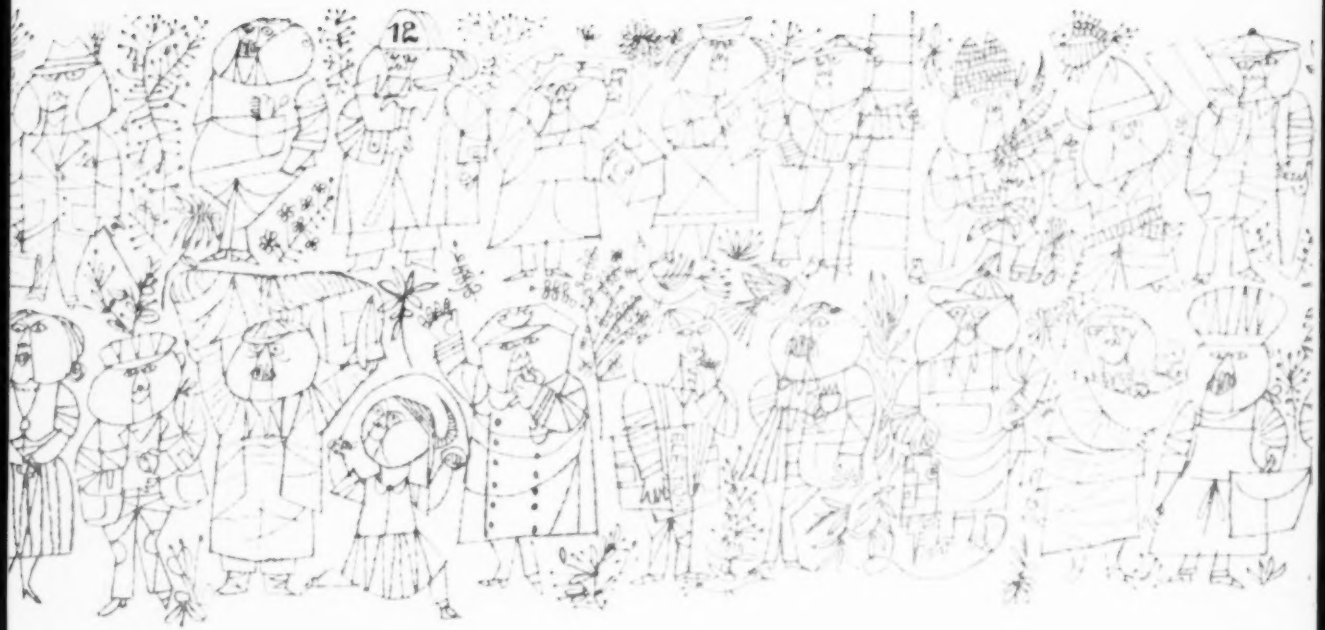
A Product of Bristol-Myers

BUFFERIN®

ACTS TWICE AS FAST AS ASPIRIN!
DOESN'T UPSET THE STOMACH!

BRISTOL-MYERS COMPANY, 19 WEST 50 STREET, NEW YORK 20, N. Y.

A similar package available from Bristol-Myers Co. of Canada, Ltd., 3035 St. Antoine St., Montreal 30, Canada



speaking of allergy, let's get down to cases

The documented record – more than 900 reports – shows literally thousands of allergic patients relieved of symptoms by Pyribenzamine. Relief has been prompt and prolonged, with extremely low incidence of sedation or other side reactions.

On the basis of published evidence, no other antihistamine combines greater clinical benefit with greater freedom from side effects. *Supplied:* Pyribenzamine hydrochloride (tripelennamine hydrochloride Ciba) 50 mg. (scored) tablets, bottles of 100 and 1000.

Pyribenzamine®

Ciba